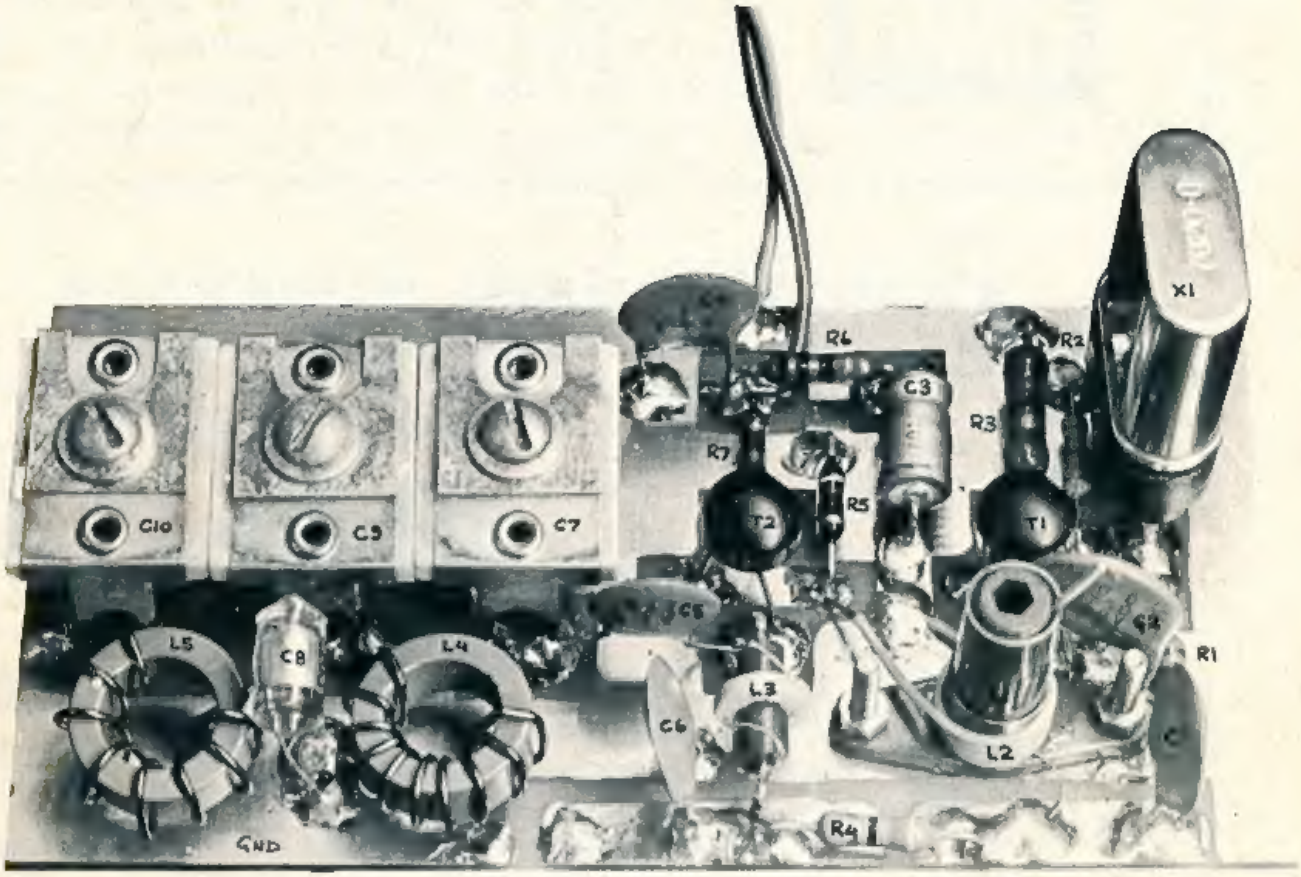
amateur radio



VOL. 43, No. 11 NOVEMBER, 1975

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COVER PHOTO

A simple, 10 x 5 cm CW Transmitter for 7 MHz. See article on page 15.

Photo: M. Crarey

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910

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QSP — *TRADING*

A long letter from a keen member in Townsville was referred by the Editor (to whom it was addressed), on his return from holidays, to the Executive.

In brief the letter suggested that the Institute should engage centrally in trading. To provide working capital contributions should be sought from members or debentures issued. At an average of $20 per member the total should reach about $90,000. The trading to be on a fully commercial basis dealing initially in amateur equipment with possible expansion at a later date into other electronic and similar fields.

This is not the first time such an idea has come up for consideration. Many Divisions have been active for a long time in limited trading activities confined to members. Surplus gear has been handled over the years but this has dwindled. Attention has therefore been directed more and more towards components and kits designed for home construction use.

A natural extension would have been a central WIA agency to handle these things but many factors prevented this from happening. Several Divisions have done very well out of their own "disposals" activities. Only in the last four years has there been a formal central organisation by Constitution.

Everything of common concern to the Institute was, and still is, controlled by the Federal Council comprising one representative from each fully autonomous Division managing State affairs.

Before the present era of inflation, coming so soon after establishing the central organisation, there was little need for large sums of money to offset costs of a non-Divisional nature.

The climate was right for normal trading companies to sell amateur requirements according to the needs of the times. There are now many outlets for amateur requirements to cater for the appliance user as well as the home constructor. In fact there are some grounds for believing that competition today has depressed the net profit margins quite considerably. A new entrant into this field must more than ever before acquire and stock the right goods at the right price for re-sale on the one hand at a competitive price and yet on the other to make reasonable profits to keep going.

If central trading were to be approved by Federal Council it would have to be done for Constitutional reasons as a separate commercial enterprise under close control and proper management. These and other requirements need not be beyond attainment.

However, the outlook for launching such a project differs according to the viewpoint be it Melbourne or Perth or Cairns or elsewhere. As is to be expected in this specialised field the largest cities seem to be well catered for although mail order business exists but increases prices and creates other problems.

It could be thought that amateur gear could be bought much cheaper if we had our own trading company but accountants demand satisfactory profits not solely to ensure adequate returns on capital.

A most detailed analysis would be absolutely essential. The Institute would have to look for an assured net profit of at least $15,000 or $20,000 after tax, staff wages, and general overheads have been paid. A few thousand dollars once every few years would not be worth the effort. To achieve such a return the annual turnover might well have to be $200,000 or more if the store has to be competitive.

The Executive would not be daunted if Federal Council decides that trading must be begun. There are ample resources available to draw on expert advice at all stages particularly to determine the viability of such a project in the beginning. It is recognised that some regular source of income is needed to keep subscription rates from getting out of hand. Many other Amateur Radio societies face this same problem.

However, an answer must be found to another equally important question. What other areas should be explored to achieve a reasonably viable source of subscription subsidisation? Such as doubling our membership, expanding "Magpubs" activities, setting up a credit union, and so on.

The Executive. ■

CUSTOMS DUTIES

Remember how the Institute's Executive went to work in the past few years to gain duty free admission for transceivers? And were successful.

The draft report on telecommunications equipment by the Industries Assistance Commission has now come to hand.

Section 2 of the report deals with interests covering aerials and radio telegraphic and radio telephone apparatus including mobile transceivers, communications receivers, HF transceivers and the like. Two sub-paragraphs of section 2, 8 in the Report acknowledged requests for duty free entry being made in relation to amateur radio equipment by the Wireless Institute among others. The next sub-para reads:—

"Some of the abovementioned products already enter under by-law. The Commission considers that the remaining requests for duty free entry of specific items would be more appropriately dealt with through the by-law system".

Page 13 of Appendix 4 to the Report adequately summarises the original Institute's submissions under Tariff Item 85.15.9 as follows:—

(a) The admission of all transceivers of a kind designed for and solely capable of use on amateur frequencies as a permanent measure — no certification, no security, no statutory declaration; applicable to new and used transceivers, for HF, VHF/UHF/SHF, commercially built or home constructed, through all ports, commercial or private imports, for re-sale or own use, as freight or in baggage and

WIANEWS

At the time of writing the burning question is still the industrial dispute which has caused disruption in the examinations area. A copy of letter 320/5/101 of 22nd September received from the Postmaster-General is published elsewhere in this issue. This was in response to a telegraphic protest sent to the Minister by the Executive when it became known that the August exams also came under the ban.

It is too early to expect that the last award handed down by the Arbitration Commission will or will not cause the door to be opened for the successful conclusion of the dispute.

Information available to the Executive indicates that meetings between the PMG's Department and all interested parties have been held on several occasions but so far without success.

The Executive is very well aware that 'outsiders' could create additional problems if they are seen to seek direct intervention but the situation is under constant review in the light of developments. This sounds all very wordy but the old adage about 'fools rushing in where angels fear to tread' was not coined for nothing.

September seems to have been a month of information flowing in for consideration of action to be taken after receiving comments from Divisions.

One such item was a letter from the Secretary of the Radio Frequency Management Division of the PMG's Department advising that the call sign block RAA to RZZ has definitely been allocated for use by any amateur repeater or beacon.

The previous allocation of the blocks RSA to RTZ solely for amateur beacons has now been rescinded — see AR Dec., 1972, p.21.

This whole question came to the fore last year when one Division required that repeater call signs should be made available so as to identify the geographical location or service areas of each repeater. As a result of this the Executive supported the request. The previous restriction of call signs for repeaters deriving from the block RAA to RAZ has thus gone overboard and presumably repeater owners can now request their own geographical call sign even if it falls within the RSA to RTZ block. Presumably the same will apply to beacons.

It is believed that the PMG's Department will have reserved the right to allocate any call-sign in the RAA to RZZ block for any other amateur use in line with the general conservation of call letters.

Another letter from the same source dealt with repeater conditions in reply to a preliminary letter from the Executive on this subject back in May. A couple of quotes from this letter might be useful. Quote number 1 — "The Department has always been happy to consider representations from your Institute and I have no doubt that this cordial situation will continue in the future".

Quote number 2 — "The Department does not propose to impose unnecessary rules on the Amateur Service but, provided they are framed within the current licensing conditions, no objection in principle is seen to additional rules being devised and applied by amateurs for operation of their services".

Yet another letter from "Central Office" clarifies the procedures to be followed by "C" calls operating in different states. It is now clear that if the owner of a "C" call registered in one State visits another State for a period not exceeding 5 days all he has to do is to change the numeral in his call sign and of course abide by paragraph 120 in the Handbook. Thus if VK3CDZ goes to Canberra for a couple of days at a time he uses the call sign VK1CDZ and not VK3CDZ/VK1 as would be customary for normal series call signs. Letter RB4/8/1 of 8-9-1975 refers.

A letter from the Minister for Defence confirms that the NDO and Directors of State/Territory Emergency Services have been advised of the name and function of the Federal WICEN Co-ordinator (Brig. Rex Roseblade VK1QJ) and asked to ensure co-operation with WICEN.

Peter Brown, VK4PJ, donated a cup designated the "Contest Champion Trophy" and the rules for this annual award have been received but await adoption. Peter suggested the first "period should be 1st October, 1975 to 1st October, 1976 and the Federal Contest Manager should take into account the highest aggregate scores obtained in the 1975 VK/ZL contest, the 1975 Ross Hull, the 1976 John Moyle Memorial NED and the 1976 R.D. Contest.

It is unfortunate that the draft rules arrived too late to be included in October AR and equally unfortunate that the office of F.C.M. is under change. In any event they must be considered and adopted as early as may be possible. The handsome trophy donated by Peter is held by the Executive and awaits its first annual owner hopefully before the end of 1976.

The Federal President is scheduled to meet Mr. F. Green, the Head of the PMG's Department, later in October at which a number of high level administrative arrangements are to be discussed. Obviously the IARU related Motions from the 1975 Federal Convention concerning W.A.R.C. 1979, legislation affecting the amateur service, examinations, licence fees and frequency management are likely to be items at the top of the list.

Also at this time of the year Divisional Councils will be seriously considering their subscription rates for 1976. The Executive have done their homework and concluded that the Federal element of the 1976 Full and Associate Members' subscriptions should indeed be recommended as the $14.50 adopted at the 1975 Federal Convention. Out of this amount $7.20 will be the direct cost of AR plus 30 cents for the IARU contribution.

Finally, it might be appropriate to mention that October was the 3rd birthday of OSCAR 6. Congratulations to everybody concerned with this amateur satellite and all amateur satellites. ■

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effects; end-user criterion inapplicable.

(b) Transmitters and transverters of a kind designed for and solely capable of use on amateur frequencies.

(c) R.F. Linear amplifiers for amateur bands only. (Note — these appear to be covered by By-law already).

(d) Communications receivers designed for use and capable of use only on amateur frequencies.

(e) Amateur band, Ancillary equipment for use with such transceivers, transmitters and receivers — e.g. outboard VFOs, tuning units, etc. Would negotiate on separate power supply units which are of a kind manufactured domestically and similar items.

(f) Items normally supplied with each piece of apparatus (e.g. microphone ordinarily sold as part of transceiver).

1. WIA (Wireless Institute) accepts the need to foster and encourage local industry but the amateur market is so selective and of such small proportions that the importation of amateur equipment not designed for use on other frequencies and not readily and cheaply convertible should enjoy duty free concessions.

2. Certain items for use by amateurs already appear to enter under by-law — e.g. Aerial rotators, monoband and multi-band antennas, HF Vertical antennas, LP Filters, antenna couplers. Some articles classified under other Tariff headings.

3. Readily understood, easily administered and positive identification at time of import are criteria greatly to be recommended in this somewhat technical field.

4. WIA happy to assist in any way and to provide definitions where desired. Would agree to importation of "difficult" items under statutory declarations for amateur end-usage.

After receiving and considering any further submissions it is assumed the draft report will become, after any amendments and additions, the final Report which will be submitted to Government in due course. Whether or not the Government will accept the recommendations of the final Report will of course remain to be seen.

BURMA

"The authorities in Burma have prohibited everything that has the slightest thing to do with Amateur Radio. Even the import of radio parts is on the black list. So if you write to an Amateur in Burma do not use his call sign. In some cases it is known that the Amateur landed in jail because of supposed activity". The World Radio News, June, 1975.

WICEN NETS—VK6

VK6AN writes that visitors to VK6 may be interested to note that the best frequencies for contacts with WICEN operators in VK6 are 3.6 MHz daily at 00.00 Z, 7.1 MHz daily at 04.30h Z and Ch 1 is monitored at all times. At 02.00h Z Sundays there is a WICEN callback after the VK6 broadcast; frequencies are 3.6 or 7.1 depending on band conditions. The other daily monitoring frequencies are given as 14.106 at 03.00h Z, 7.078 at 08.30h Z, 146.00 MHz FM nightly as well as 52.656 MHz in most areas most of the time Ch 4 is monitored in the Narrogin-Wagin area and Ch 2 in the Albany-Mt. Barker area.

TRANSCRIPT OF ADDRESS BY THE PRIME MINISTER OF AUSTRALIA, THE HONOURABLE E. G. WHITLAM, Q.C., M.P., OPENING THE 1975 REMEMBRANCE DAY CONTEST ON 16th AUGUST, 1975

"I am honoured by your Institute's kind invitation to declare open your 1975 Remembrance Day Contest.

It is right that we should remember the amateur radio operators who laid down their lives for Australia during two world wars.

This occasion has taught me a little more about your useful and remarkable hobby. Perhaps the word 'hobby' is a misnomer for such a varied leisure activity. Your contacts as radio operators are truly world-wide. As amateurs you have been experimenting for many years with your own satellite and communicating with other amateurs as far afield as Africa and Japan. With the next generation of amateur satellites you will be able to contact your friends much further afield in the U.S.A. and elsewhere.

In these days of developing communications Australians can pick up their telephone for discussions with people round the globe at any time, but the process is expensive. It is surprising indeed that you in your shack can talk at almost no cost with old friends and make new ones anywhere in the world. You are truly private ambassadors for Australia and I have no doubt that the wide network of amateur radio communication makes a valuable contribution to international understanding.

I commend your work in providing communications with stricken areas and your ability to move into action quickly in a national emergency. My colleague, Senator Bishop, the Postmaster-General, assures me that every possible facility is given to amateurs involved in emergency traffic. I believe the use of amateur satellites for communications in emergencies will be more fully exploited.

At present you have training classes for your members, particularly in Youth Radio Clubs, and I hope you will try to widen your educational programmes and bring knowledge and experience of your existing work to the widest possible audience.

Young people today with their natural interest in scientific knowledge and advancement would want to know more of your work and how they may participate in it.

I have much pleasure in declaring open the Wireless Institute of Australia 1975 Remembrance Day Contest". ■

THE NORTH QUEENSLAND CONVENTION

London has its Changing of the Guard.
Melbourne has its Moomba.
And Townsville —
it has its Radio Convention
which is better still.

You who weren't there missed out on a great time while the lucky ones who did attend had a ball.

Occurring during the bleak southern winter month of July, it provided a very enjoyable escape for those that came, for the daytime weather was fine and sunny and the nights mild. The only unfortunate thing is that it occurs only each second year — but perhaps that's a good thing as it allows new ideas to be thought up and plenty of planning to be made by visitors.

The programme of events took second place to the renewal of old friendships and the kindling of new ones.

This is the true meaning of Convention — where souls of a like nature convene. As a result Amateur Radio has received a valuable 'Shot in the Arm' by the efforts of the Townsville Amateur Radio Club in North Queensland.

VK4ZEZ,
Townsville Amateur Radio Club
Publicity Officer ■

AOCP EXAMINATIONS

The following letter was received in response to a telegram sent by the WIA.

320/5/101

Postmaster General
Canberra, ACT 2600
22 September 1975

Dear Mr. Dodd,

I refer to your recent telegram concerning the postponement of the August examination for the Amateur Operator's Certificate of Proficiency.

The industrial dispute which has so far prevented this examination from being held, concerns staff classifications. The parties involved in the dispute are the Australian Public Service Board, the Staff Association representing the officers of my Department who conduct examinations and, to a lesser extent, my Department.

Attempts to reach a solution to the dispute are being pursued as expeditiously as possible. Noting, however, that certain instructions have been given to staff by their Association, it would be pointless to attempt to re-schedule the examination until the difficulty is resolved.

The dispute has already been widened to include other examinations conducted by my officers and I am loath to initiate any action which could precipitate further disruption of my Department's activities.

I regret that some inconvenience was caused to candidates but I am sure you will appreciate that the postponement is outside the control of my Department.

You may be assured that following settlement of the dispute, the earliest practicable date will be selected for the examination and all candidates advised accordingly.

Yours sincerely,
R. Bishop

Mr. P. B. Dodd, Secretary,
The Wireless Institute of Australia,
P.O. Box 150, Toorak, Vic., 3142 ■

HISTORY OF SOUND AND MOVIES

In a recent letter from Jim Davis, registered SWL and future novice licensee of 55 James St., Latrobe, Tasmania, comes news of a rather unusual sideline.

Jim has obtained and fully restored equipment to depict the History of Sound and Movies.

The attached photograph gives a brief idea of some of the equipment on display.

This includes the 1916 Telefunken Spark transmitter/receiver used by the Navy during World War 1 at Currie, King Island, TRF Battery Receivers, 'all electric' sets of 1928 vintage, one of the first Erame Record players with automatic changer, an 1893 Edison Projecting Kinetoscope and many other items from the early days to the present time.

The museum is on display in Jim's private Cinemascope theatrette in his new home at the above address. Jim states that visitors to 'the shack' would be most welcome. ■

AMATEUR BUILDING BLOCKS

PART FIVE

H. L. Hepburn VK3AFQ
4 Elizabeth St., East Brighton, 3187

DIGITAL MODULES

This final part of the Building Block series covers the predominantly digital functions. Three such modules are presented — a crystal clock pulse generator, a gating and control unit and a display or indicator unit.

Section 2 — Unit H — CRYSTAL CLOCK

This unit is a comprehensive crystal clock and divider chain which produces accurately controlled timing pulses between 10 MHz and 0.025 Hz. The module can be used for a variety of purposes including control of a counter or timer, production of frequency markers and to act as a standard in the digital stabilisation of a VFO.

The circuit diagram is given in Fig. 21 while the component layout is given in Fig. 22.

A 10 MHz crystal oscillator is formed using two gates of a 74 HOO or 74 SOO quadruple NAND array, the remaining two sections being used to buffer the output. The oscillator is followed by eight 7490s in the divide by ten mode and outputs taken after each stage so that a total of nine decade outputs are available ranging from 10 MHz down to 0.1 Hz.

Also on board, but divorced from the main divide chain, is a 74107 dual JK flip flop. This chip enables any one of the main decade outputs to be further divided by two and/or four so that, if required, outputs down to 0.025 Hz, or one pulse every 40 seconds, are available.

Note that each output from the dividers is capable of driving another eight 7400 series inputs so that, for example, the 100 pps output could be used to drive external logic and at the same time could be routed through the 74107 to provide 50 Hz and 25 Hz as well. The only forbidden interconnection is to join two outputs together.

While a trimmer is provided on the board to adjust the crystal to its correct operating frequency it is often worthwhile to be able to do this adjustment from a remote point — say a front panel control. Provision is therefore made on the board for a BA102 varactor diode and its associated decoupling components. The only off board control is the potentiometer and associated 3.3K fixed resistor. It should be stressed that the supply to the potentiometer, and thus to the varactor diode, should be very well regulated or else the facility will degrade the stability of the oscillator. The value of the control voltage is less important than its stability, any value between 10 and 15 volts being satisfactory. If this external control facility is not required the components are simply omitted.

The accuracy of the clock is a direct function of the crystal used. If the accuracy requirements are modest (say 1 part in 100,000) then a low priced crystal can be used. Short term accuracies of the order of 1 part per million can be obtained using a Hy Q Delta GF crystal which is more expensive but which has been designed to have minimum change of frequency with temperature in the 15-25 deg. C region. For greater accuracy, a crystal oven and a crystal designed for the oven temperature are necessary.

With the exception of the varactor supply (if it is required), the whole module is powered from a 5 volt regulated line. Use of a LM 305K (National) or 7805 (Fairchild) monolithic regulator is advised and these are freely available at a modest cost from most supply houses. Note that if these regulators are used then an input capacitor of 0.1 or 0.22 mFd and a 4.7 or 10 mFd tantalum capacitor should be fitted right at the regulator using the shortest possible leads.

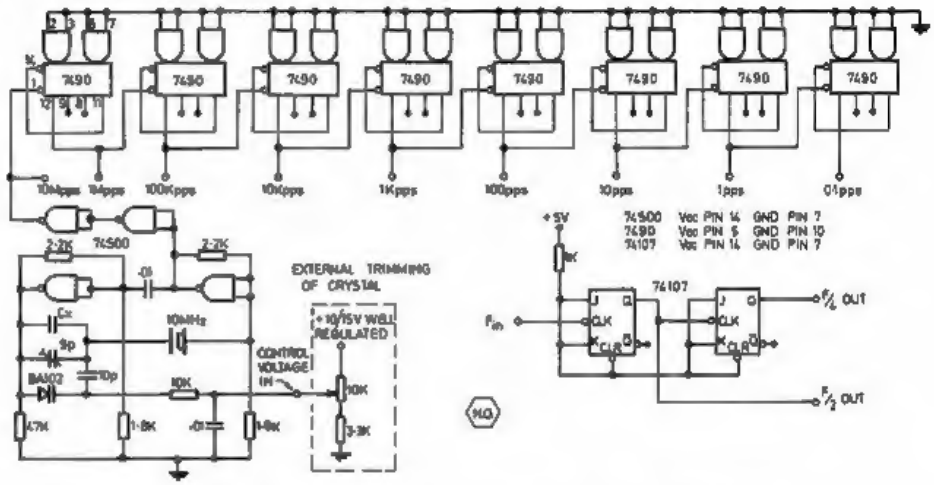

FIGURE 21 — UNIT H — CLOCK OSCILLATOR AND DIVIDERS

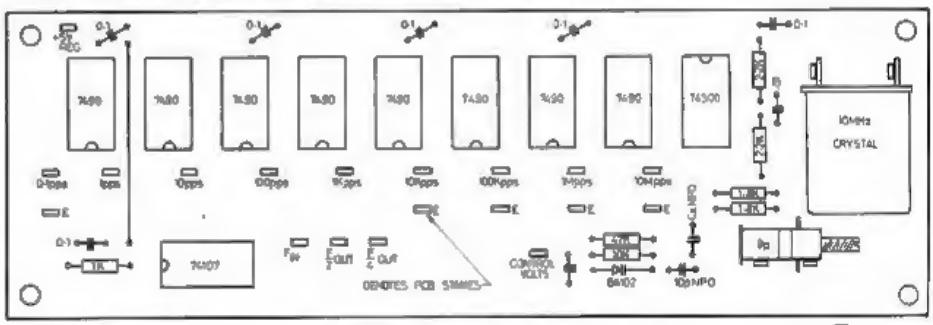

FIGURE 22 UNIT H CLOCK OSCILLATOR AND DIVIDERS COMPONENT LAYOUT

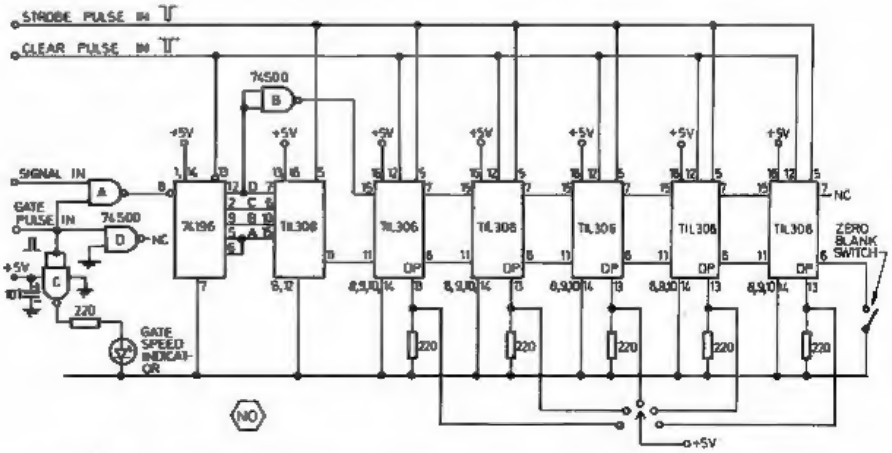

FIGURE 23 - UNIT I - 40MHz 6 DIGIT DISPLAY - CIRCUIT DIAGRAM

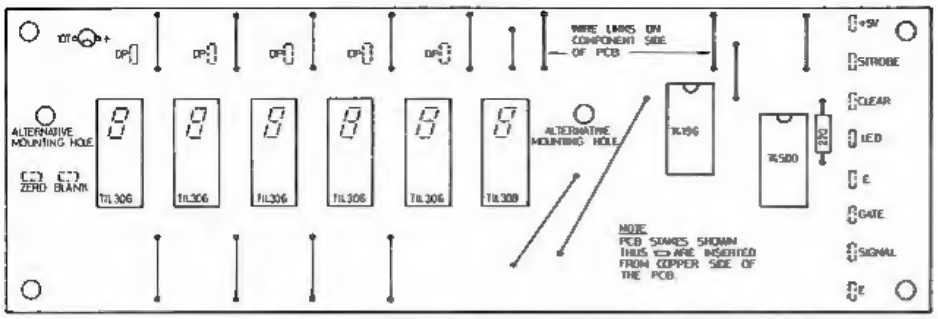

FIGURE 24 – UNIT 1 – 40MHz 6 DIGIT DISPLAY – COMPONENT LAYOUT

If the full range of output down to 0.025 Hz is not needed then the decade dividers (7490s) after the lowest required frequency are omitted. For example, if only a 100 kHz signal is wanted then only dividers 1 and 2 are used and dividers 3 to 8 omitted.

Section 2 — Unit I —
GATING AND DISPLAY UNIT

The proliferation of opto-electronic devices over the past two or three years has been rapid. Whereas in late 1972, when the writer was designing a counter (later described in AR), the only easily obtainable display was the incandescent filament 3015F. At the present time this type of display has been superseded by a wide variety of LED based readouts which vary in size, format and drive requirements. Most decade display units published in amateur literature have been made up of four separate ICs (divider, latch, decoder/driver and readout) each requiring a relatively large PCB to mount them and some sort of base in which to plug each decade board. More recently devices containing all the functions combined into one 16 pin DIL case have become available, notably the Texas Instrument TIL306/308 series. Use of these 'combined' displays has much to recommend it since the total area of PCB required is considerably reduced, the labour of wiring up has been significantly lowered and the volume of a complete display has been cut to under a quarter. Total cost (as distinct from chip cost!) has also been reduced. Thus the writer has designed the display unit now presented around the TI devices. They are stocked by the Radio Parts Group, 562 Spencer Street, West Melbourne, Vic. 3003.

The TIL306, which is a seven segment, two bars per segment, LED decade divider, latch, decoder and readout with a LH decimal point option, has one minor limitation in that the maximum operating frequency of the decade divider is 18 MHz. However this is only a problem in the right hand (or least significant figure) display and when it is desired to read a frequency to the nearest Hz.

In order to overcome this frequency limitation a TIL308 is used in the first stage. This is a TIL306 without an inbuilt decade divider, the division being done outside the chip using a high frequency divider such as the 74196 to give the display a 50 MHz capability. This is the approach adopted as reference to the circuit diagram (Fig. 23) will show. The signal gate is on the display board and uses a 7400 (for inputs up to 20 MHz) or a 74 S00 (for frequencies up to 40 MHz). Only five inputs are required:

1. 5 volts 1 amp well regulated HT.
2. Signal — amplified and squared so as to be TTL compatible.
3. A negative going strobe pulse.
4. A negative going clear pulse.
5. A positive going timing pulse.

All the required inputs, except the 5 volt regulated supply, are produced by Unit J which is the next (and last) unit described in this series of articles.

Only two of the four gates of the 7400/74 S00 are essential to the display proper so use is made of one of the spare gates (Gate C) as a buffer/driver for a gate speed LED which can be mounted remote from the display on some other part of whatever cabinet is used. This gate speed indicator is purely optional.

The incoming (TTL compatible) signal (from Unit J for example) goes to one input of Gate A, with the timing pulse from the control unit being applied to the other input of Gate A. When the timing pulse is high, Gate A passes the input pulse to the display. When low the signal pulses are not passed.

The pulse train passed by Gate A to the display enters a 74196 50 MHz decade divider. The binary outputs are taken to the TIL308 for decoding and display. The D output is inverted by Gate B and applied to the input of the first of five TIL306 decades.

The facility is provided to blank out all zeros showing on the left hand side of the display. Preferences for this type of zero blanking seem divided so that an external switch is suggested to allow the facility to be used if desired. One point in favour of zero blanking is the reduction in the overall current demand of the display.

No specific decimal point switching is given since the exact format will depend on the use to which the display is put. The circuit diagram (Fig. 23) shows that it is necessary to take the DP pin 13 low to extinguish it. This can be accomplished by permanently wiring a 220 ohm 1/8th watt resistor between the DP pin of each of the five TIL306s and earth. Applying 5 volts regulated (either directly or via a multi-position rotary switch) will cause the DP to light up. Note that if the DP pin connection is left 'floating' (i.e., not connected directly to earth or to earth via a low value resistor) then it will remain alight.

It is strongly recommended that 16 pin IC sockets be used to mount the TIL308 and the TIL306s and that the devices themselves not be soldered directly into the board. Sockets leaving a space between the back of the TIL306/308 and the centre of the socket are recommended to allow a free flow of cooling air over the displays.

Components are mounted in the usual fashion on the non-copper side of the board, but the PCB stakes shown in Fig. 24 are inserted from the copper side of the board, since it is this side which is accessible when the board is in place on the panel.

Board mounting details are given in Fig. 25.

A separate PCB stake is provided for each TIL306 decimal point. The DP outlets and their associated 220 ohm resistors are wired as dictated by the DP switching used.

The physical and electrical format used for this display board makes it extremely flexible. The display will continue to operate even if the TIL306 is not in place, although of course it will have ten times less readout resolution. Similarly successive left hand TIL306s can be removed without causing the display to stop operating. The practical minimum number of displays is probably three. Since the clock module (Unit H), the display module (Unit I) and the processor module (Unit J) have so many options, the ways in which they can be combined together are also many.

The writer is prepared on receipt of a stamped addressed envelope) to give interconnection and switching information where the enquirer has a specific end use in mind.

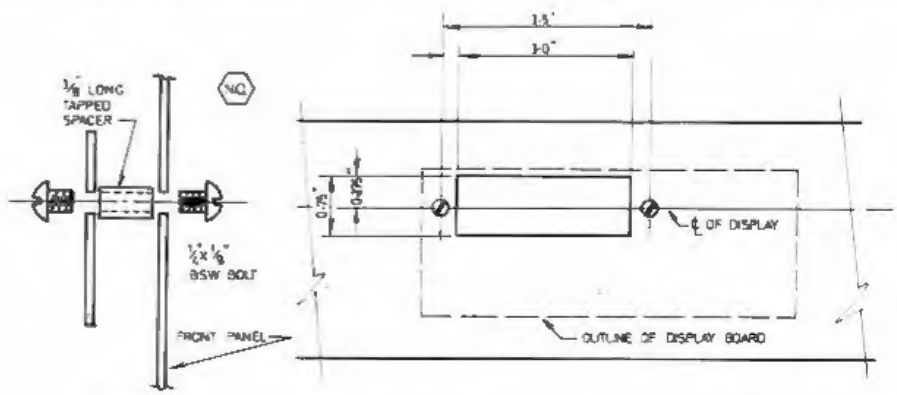

FIGURE 25 – DETAIL OF DISPLAY MOUNTING USING ALTERNATIVE MOUNTING HOLES

Deluxe Mobile/Base Station FT-101E/EE — *from Yaesu Musen Co. of Japan*

E MODEL
with
RF PROCESSOR
$698

EE MODEL
without
RF PROCESSOR
$651

RF SPEECH PROCESSOR — $70 plus P & P

Solid State 160 thru 10 Meter Transceiver

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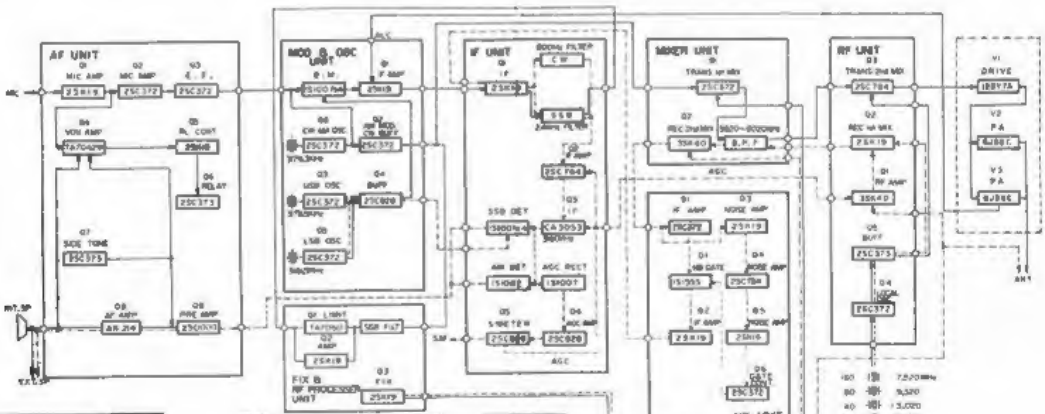

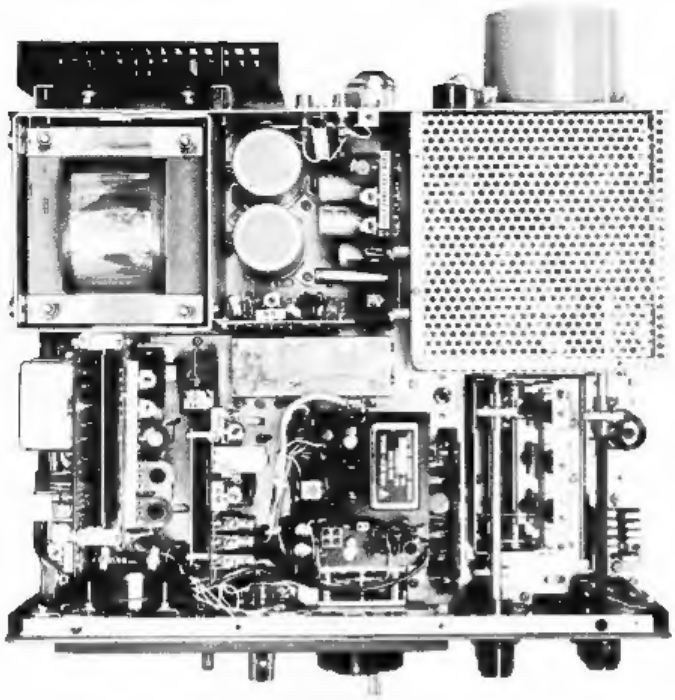

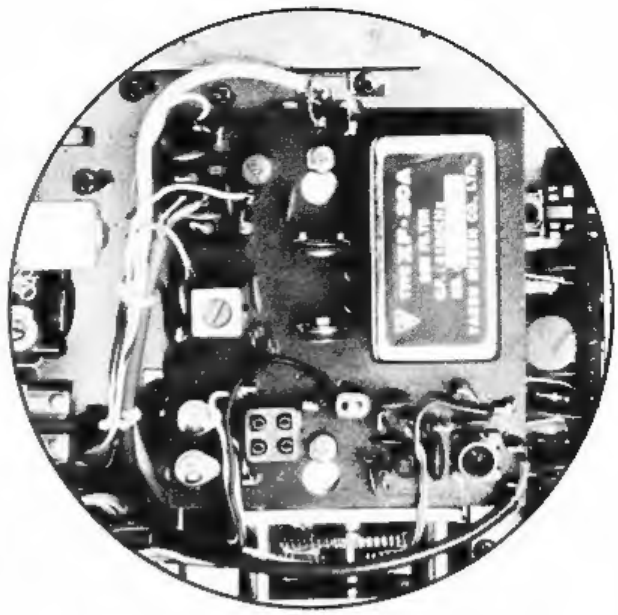

Built in R.F. Speech Processor

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- ★ Built-in AC & DC power supplies
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- ★ Factory sealed, solid state VFO for optimum stability and accurate 1 KHz readout
- ★ Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- ★ Built-in, fully adjustable VOX
- ★ Automatic break-in CW operation with sidetone
- ★ Selectable 25 KHz and 100 KHz calibrator
- ★ ±5 KHz receiver clarifier w/separate ON/OFF switch
- ★ Built-in WWV/JJY reception
- ★ Heater switch to shut off final tubes for conservation of current drain.
- ★ Reliable easy to operate lever panel switches
- ★ Adjustable carrier level for tune-up and novice operation
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- ★ High-Q, permeability tuned, RF stages to provide the performance required even in base station operation
- ★ Includes dynamic, hand-held type microphone
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- ★ Eight pole SSB filter for unparalleled selectivity on today's crowded bands
- ★ All mode operation — SSB, CW & AM
- ★ Built-in internal crystal control provision and Dual VFO adaptor.
- ★ Complete line of compatible accessories for flexible station design (CW filter, ext. VFO, ext. speaker, mobile mount, 6 m transverter, monitorscope, digital readout adaptor)
- ★ English language factory instruction manual with full circuitry, AC and DC power cables, all connectors.

TECHNICAL DATA

GENERAL

Frequency Range: 1.8-2.0 MHz, 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 27.0-27.5 MHz, 28.0-30.0 MHz all full transmit and receive. WWV 10.0-10.5 MHz (receive only). One auxiliary 500 kHz segment is available except for IF and VFO frequency range. Heterodyne crystal for 1.8-20 MHz is available optionally. (NOTE: All our sets include this crystal).
Mode: Selectable USB, LSB, CW or AM.
Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 100 Hz with 10% line voltage variation.
Calibration Accuracy: 2 kHz maximum after 100 kHz calibration.
Backlash: Not more than 50 Hz.
Antenna Impedance: 50 to 75 ohm unbalanced nominal.
Circuitry: 40 Transistors, 3 Integrated Circuits, 38 Diodes and 3 Tubes.
Power Requirement: 100/110/117/200/220/234 V AC, 50/60 Hz, 350 Watts maximum, or 13.5 V DC nominal, 5 A for standby, 0.5 A for receive (Heater OFF) and 20 A for transmit.
Size: 340(W) x 153(H) x 285(D) m/m.
Weight: 15.9 kg. (Shpg. wt.: 20 kg.).

RECEIVER

Sensitivity: 0.3 uV for 10 dB Noise plus Signal to Noise Ratio on 14 MHz.
Selectivity: 2.4 kHz nominal band-width at 6 dB down, 4.0 kHz at 60 dB down on SSB, CW and AM. 600 Hz nominal bandwidth at 6 dB down, 1.2 kHz at 60 dB down with optional CW filter.
Harmonic & Other Spurious Response: Image Rejection better than 50 dB. Internal Spurious Signal below 1 uV equivalent to antenna input.
Automatic Gain Control: AGC threshold nominal 3uV. Attack time 8 milli-Second and release time 1800 milli-second.
Audio Noise Level: Not less than 40 dB below 1 watt.
Audio Output: 3 Watts to internal or external speaker at 4 ohm impedance.
Audio Distortion: Less than 10% at 3 watts output.

TRANSMITTER

Input Power: 260 Watts PEP on SSB, 180 Watts on CW at 50% duty cycle and 80 Watts on AM except for 160 metre. Slightly lower on 10 metre).
Microphone: 50 K ohm dynamic type.
Carrier Suppression: —50 dB.
Sideband Suppression: —50 dB.
Spurious Radiation: —40 dB.
Distortion Products: —30 dB.
Frequency Response: 350 to 2700 Hz ±3 dB.
Final Tube: 6JS6C x 2.

All prices include S.T., Freight extra. Prices and specifications subject to change. **90 DAY WARRANTY**

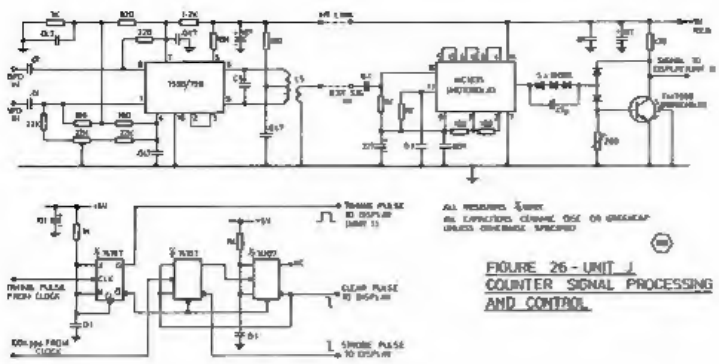

FIGURE 26 - UNIT J COUNTER SIGNAL PROCESSING AND CONTROL

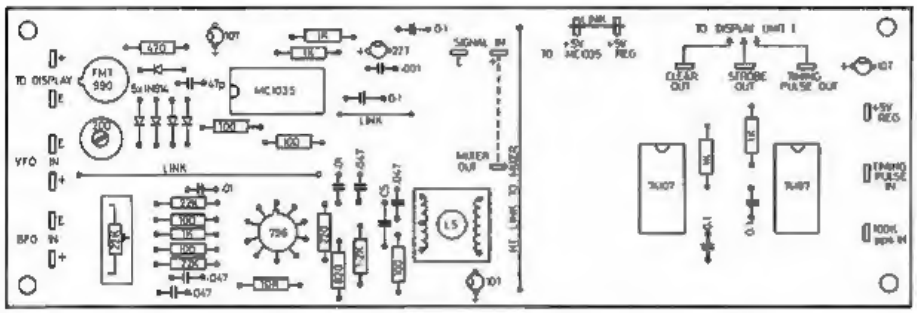

FIGURE 27 - UNIT J - COMPONENT LAYOUT

Section 2 — Unit J — SIGNAL PROCESSING AND CONTROL

This module has three functional roles. In the first place it acts as a signal shaper accepting a low level (better than 30 mV RMS) signal and after amplification and squaring, outputs a TTL compatible waveform to drive the six digit display of Unit I.

Secondly it generates the necessary gating strobing and clearing commands so that the display unit may be used as a counter and finally, the module provides a mixing facility so that, say, the BFO and VFO of a single conversion Rx/Tx can be combined to re-constitute the signal frequency and allow it to be displayed in the form of a 'digital dial'.

Fig. 26 gives the circuit diagram of the three functions involved, Fig. 27 gives the component layout on the 6 in x 2 in circuit board, while Fig. 28 shows how Units H, I and J can be interconnected to make a 30/40 MHz digital frequency meter or a digital dial display.

The signal processor uses a Motorola MC 1035P triple line receiver. The circuit is the same as that used in the DFM described by the writer in AR (1973). In spite of much experimentation with other, and simpler, signal processors the original circuit is still considered to be the most flexible, especially at higher frequencies, and has thus been retained. The input impedance is approximately 1000 ohms and sensitivity is better than 30 mV RMS from 100 Hz to 40 MHz. Occasionally some low frequency instability is encountered and can be cured by additional decoupling of the bias supply (Pin 9) with about 2000 mFd. A response down to 10 Hz can be obtained by increasing the size of the two 0.1 mFd capacitors associated with Pins 10 and 11 to 1.0 mFd or larger.

The control circuitry is, again, essentially that used in the 1973 counter except that 74107 dual JK flip flops are used in place of 7493s, and the omission of the strobe buffer/inverters. These buffer inverters were originally needed to provide the positive going strobe pulses required by the 7475 latches used, but the TIL306 devices now used require a negative going strobe pulse which can be obtained direct from the control flip flops.

Two inputs to the control section are needed:

(a) A fixed 100K pps from the crystal clock of Unit H.

(b) A timing pulse from the crystal clock of Unit H. If the modules are to be used only as a digital dial then this timing pulse can be fixed at 10 pps or 1/10th second. If the modules are to be used also as a counter then switched selection of 1.0, 10, 100 and 1000 pulses per second from the clock is recommended, giving four sampling periods of 1.0, 0.1, 0.01 and 0.001 seconds.

The three outputs from the control section (gate, strobe and clear pulses) are connected direct to the corresponding inputs of the display module (Unit I). If types of display other than the TIL306/308 are used then it may be necessary to invert and/or buffer the clear and/or strobe pulses. Otherwise the TTL outputs from the control section are compatible with most other displays in current use.

The third on board function is a mixer, the purpose of which is to combine two inputs to give an output which is at signal frequency, and which can thus be processed and displayed (in conjunction with the crystal clock and the display unit) in the form of a digital dial.

The modules A through E (in previous issues of AR) describe single conversion receivers and/or transmitters. The incoming signal is either added to or subtracted from the VFO frequency to produce a fixed IF frequency. At zero beat (for AM) or with intelligible speech (for SSB) this IF frequency is exactly equal to the BFO input. Thus all that is necessary to reconstitute the signal is to add or subtract the VFO to or from the BFO.

As an example consider a signal on 14.1000 MHz and a VFO set at 5.1020 MHz. The resultant IF is 8.9980 MHz — the normal USB BFO crystal frequency.

To reconstitute the *ACTUAL* signal frequency it is necessary only to add the 8.9980 BFO frequency to the VFO on 5.1020 MHz to get 14.1 MHz.

The necessary mixing is done in a Motorola 1496/1596 or Fairchild 796 HC in exactly the same way as this device was used in earlier modules. The output tuned circuit is on the required signal frequency. The data for coil LS and resonating capacitor CS is the same as that given in Table 2.8 in the September 1975 issue.

Note that in a single conversion system the transmitter output is the algebraic sum

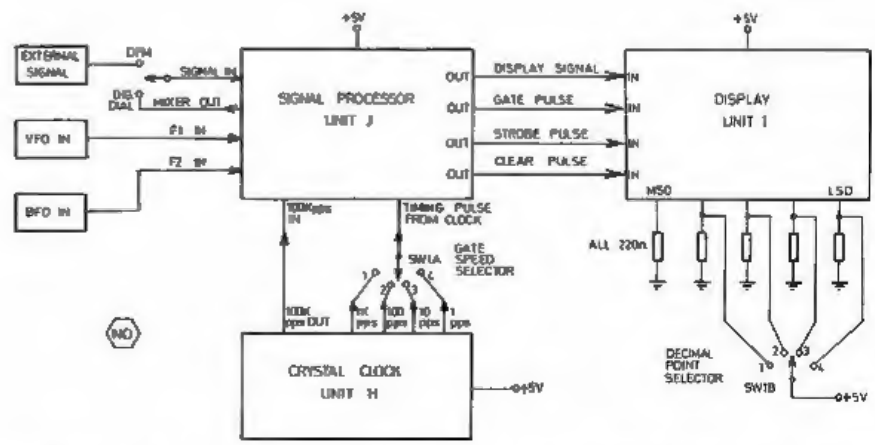

FIGURE 28 - INTERCONNECTIONS FOR A 6 DIGIT 40 MHz DFM AND DIAL

of the BFO and VFO frequencies and thus, for a transmitter only, the mixer is probably redundant. However, if the mixer is in use to reconstitute the frequency of a received signal then its use also to display the transmitted signal seems logical and avoids switching when changing between the receive and transmit modes. Where a 'clarifier' is in use then the frequencies of the transmitted signal and the received signal are not necessarily the same and use of an available facility to show the difference seems warranted.

Since only around 30 mV RMS is all that is required as input to the MC 1035 signal processor, the demands on the 1596/796 mixer are minimal and it can conveniently be powered by the same 5 volt regulated supply that is used by the rest of the on-board logic.

Links and PCB stakes are used so that the mixer, or the signal processor, or the control section can be used separately if so desired. Although provision is made on the board to balance out residual carrier (the two 22K fixed resistors and the 22K trimpot between Pins 1 and 4 of the 1596/796) this facility may not be strictly necessary when there is a large difference between the BFO/VFO and the mixer output frequency.

During the development of the three digital modules the writer had some doubts about putting them into the same cabinet as the transceiver proper However (and rather surprisingly) no desensitisation of the receiver was noted and the system has been used several times since with no problems. ■

SOLAR FLUX, SUN SPOT CYCLE, AND THE DXer

Frank Hine VK2QL
30 Abbotsford Rd., Homebush, NSW 2140

For those amateurs who wish to keep the chart in March 1975 AR up to date, the following are the smoothed mean values issued since my article was prepared —

May 1974, 36.4; June, 36 2, July, 34; Aug, 33.1; Sept 32 1

I have gathered some additional information which may be of assistance to those who have shown interest in my previous brief reference. WWVH g ves the solar flux number and other propagation information in its broadcast on their 5 MHz transm ssion at 45 minutes past the hour and th s possibly suits the VK boys better than WWV. I get a good signal from them round 0745Z.

One nteresting thing has emerged in the almost da ly check I make, and that is the variation in the signal from WWV as against WWVH. One particular day WWV was better than WWVH

It now transpires that the information broadcast by WWV & WWVH has been included at the request of radio amateurs.

To date there has been no further sunspots of the new cycle reported and the latest "guess" is the bottom will not be reached until early 1977. Wh lst my previous article mentioned my records go back to 1954, this was used for the purpose of the exerc se only whereas in fact they go back to 1750.

For those who remember the magnificent band conditions we experienced in 1956, they and others may be nterested to know the nearest previous high sun spot peak occurred in 1778 when the sunspot number was in the region of 150. The next highest number did not occur until 1946, when the peak was in the region of 156, followed by the best ever in 1958, that cycle being numbered 19. I will be referring to cycle numbers aga n later The last cycle, No. 20, reached 119 (see March AR table), which was similar to 1917. The 1928 cycle, 16, only reached a peak of 80. After the peak of 1778, cycle 3 ment oned above, each cycle was less until the two owest numbers occurred in 1804, and 1816 when the peak of only approx. 45 was reached. The next cycle, No. 7 in 1830 only peaked at 65. The bottom between cycles 5 & 6 and 6 & 7 reached approx. zero. So . . ., if sunspot activity follows its previous pattern after a good cycle, amateurs are going to have to work hard for real DX, especially DXpeditions, and to help them know what to expect, keep a close watch on flux numbers etc. from WWVH and also the sunspot numbers.

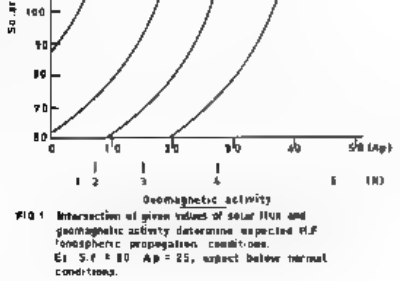

FIG 1 Intersection of given values of solar flux and geomagnetic activity determine expected HF ionospheric propagation conditions. Ex: S.F = 80 Ap = 25, expect below normal conditions.

In Fig. 1 is reproduced a graph which was in an article written by W3ASK in March '75 CQ.

By use of this graph in conjunction with the reports given over WWV/WWVH, the DXer can get some idea of the propagation conditions he may expect. The graph has now caused me to keep in my daily records, the index as well as the flux number The K index varies from 1 to 9, the higher the value, the greater influx of solar particles, which in turn causes weaker signals.

Solar flux indicates the degree of ionisation in the earth's atmosphere and the K index measures the activity of the earth's magnetic field or any possible magnetic disturbance.

In general, the higher the value of solar flux and the lower level of magnetic activity, the better the HF bands will be for DX, and the reverse if the flux number is low and the magnetic activity high. During April a Solar flux number of 67 was recorded.

Use the following procedure in applying the use of Fig. 1. Assume that WWVH broadcast reports a solar flux number of 80 and a K index of 2. The intersection of these values within the area defined as "high normal" is the result, and it could be worthwhile to expect some reasonably good HF DX. If a flux of 70 is reported with a K index of 5, one may as well be in the garden or watching TV or doing that job that has been outstanding for years.

Use the same method of application to the graph, if instead of the K index you have an A index figure, e.g. Solar flux of 70 and A index of 5 or less, the band is worth watching

The diagram and detail shown in Fig. 1 can be put to use by the VHF fraternity who are interested in DX. When the flux reading, and the A index figures take the propagation conditions into the **below normal** or **disturbed** area, there is a good chance that unusual propagation may occur on the 50 and 144 MHz bands. As Auroral conditions usually accompany radio storms, they could produce some sporadic-E ionisation. Accordingly, there is good reason for the VHF operator to daily check the WWV/WWVH broadcasts. Waiting for the information over the VK2 broadcast will be useless; the information must be obtained daily and checked against Fig. 1, as VHF operators are aware that they have to watch the band for the openings. The use of the information from WWV/WWVH could be very helpful, so it could be that an amateur who uses the HF and VHF bands, may not have to be occupying himself in some other chore, after all.

However, as IPS have told me, there is still a lot to be learned on what goes on in the ionosphere and things happen which are completely unexpected and nothing appears on the scientific information available to indicate what is happening. Such an occurrence was on April 17. It is a long time since I have heard the band full of European signals on 14 MHz short path in the mornings, yet when turning to that band at 2100 GMT, it was full of them and one only had to send a callsign and they were at you like a swarm of bees. Yet the flux number was only 69. I only wish now I had kept a record of the A ndex for that day. By 2200Z, the band had changed and the US stations were coming through full bore. Next day flux was 68 but not a sign of a European.

In respect to the A index, the following applies. Figs. 100 to 400, Impossible conditions, 30 to 40, poor to fair; 15 to 30, fair; 0 to 15, good to excellent

For those who may not be aware of th s, over the weekly broadcast by the VK2 Division, as well as the recent introduct on of the flux figures for the preceding week, the IPS provide information of what transpired n the past week and what may be expected in the week to come, such as 'a recurrent disturbance is due to start on a certain date or may be a sun spot has appeared or flares occurred on certain times of a particular day.

WWVH, after giving the flux number g ves the sunspot activity, index etc at the current time and then a forecast for the next 24 hours but not all amateurs have the equipment to cover WWV/WWVH, so the next bet is the VK2 broadcast

It is well that amateurs be aware of the difference between a sunspot and solar flare. Solar flares do not always occur near sunspots and they occur only in the day t me. A flare causes greater absorption and may be accompanied by emission of solar part cles or so-called 'magnetic storm particles' and these arrive at the earth one to two days after the occurrence of the flare and hence we have the magnetic storm, ionospheric storm, etc

The most prominent occurrence with this type of storm is a reduction in the MUF and an increase in the absorption, which in effect means a narrowing of the useable number of DX bands, so 3.5 and 14 MHz can be affected. During recent months, the most reliable band for DX has been 7 MHz, but even t has shown adverse propagation at times. The areas worst affected at this time are the Geomagnetic poles and auroral zones.

For those who have just started their 'DX careers' and are somewhat d sheartened when they hear old timers talk ng about the DX they have worked and the newcomer has never heard such a station, they can take some heart from the knowledge that a sunspot cycle rises much faster than it falls. Just think of a graph and the lead ng side is much steeper than the fa ling s de, so once we do reach the bottom of the present cycle, No. 20, you can watch the DX come back again But if we are in for another small cycle it won't be too good

I am fortunate in having, due to my fellow 'student' of sunspot activity, K4GSU, obtaining it for me, a copy of some 'good gen' from the US Dept of Commerce. There s far too much to include in this article, but if any one is interested, they can write to:

US Department of Commerce,
National Bureau of Standards
Boulder,
Colorado USA 80302,

and ask for their literature NBS special publication 236 and a copy of the paper by K. D. Boggs, Ionospheric Forecaster, Spectrum Utilisation Division.

One final word. Most of the information promulgated by WWV/WWVH is for the North Atlantic area, but can be put to good use by radio amateurs in Australia. ■

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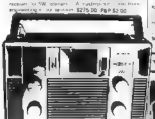

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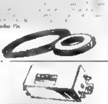

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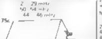

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LOUDSPEAKERS AS MICROPHONES

Alan Renton, VK4AZ
The Manse, 13 Herbert St., Proserpine, Qld. 4800

Recently I was given for my junk box a dynamic microphone which had been through a cyclone. I salvaged the transformer and was interested to see that in conjunction with loudspeakers from both valve and transistor radios, the resulting combinations were quite sensitive microphones.

Then I decided to see whether I could dispense with the microphone transformer and instead use the output transformer, that had originally taken the output of a 6V6GT, coupled to the loudspeaker of a mantel radio. The loudspeaker was an ancient 6 inch 3.5 ohm Rola.

Using this loudspeaker plus its own transformer as a mike, I connected it to a Philips (valve type) tape recorder. The sensitivity was very much greater than the rather high quality dynamic mike that I normally use. Indeed, we were able to get quite good recordings of frogs, crickets etc., from the window of the house. The quality of the reproduction was reasonably good.

Later I disconnected the loudspeaker plus transformer from the tape recorder and connected a 20k ohm per volt multimeter across the transformer. I was able to get an output of one volt by speaking into the loudspeaker in a reasonably loud and low tone of voice.

Then I tried using the combination as the microphone for my FT200 transceiver. I adjusted the ALC so that its output was comparable to the usual dynamic mike.

Two amateurs, one in South Australia and one in Southern Queensland gave me reports comparing the loudspeaker with the dynamic mike. The VK5 reported that the speaker was slightly more bassy but that it would serve very well as a stand-by mike. The other amateur actually thought that the speaker gave an improved performance.

The speaker was not in an enclosure and even had a 1½ inch long tear in the diaphragm!

Perhaps the above may be of use to young amateurs with strained finances or to any who might be looking for a very sensitive microphone at short notice. ■

QRP CW RIG FOR 7 MHz

Drew Diamond VK3XU
55 Wilbur Rde Ashwood, 3147

Presented here are all the details of a simple low-power CW transmitter for the experimenter. Interstate contacts have been made with this transmitter and an ordinary inverted-Vee dipole antenna. Power output is about 500 mW into 50 ohms from a 12 volt supply. The transistors used are cheap (about 40c) and readily available. The power supply used is two 6V9 lantern batteries connected in series to produce 12 volts.

The photograph shows the form of construction used, a small fibreglass board

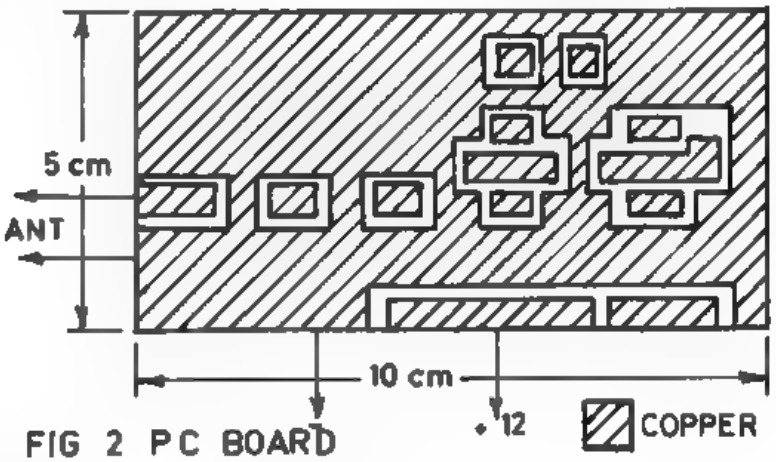


FIG 2 PC BOARD

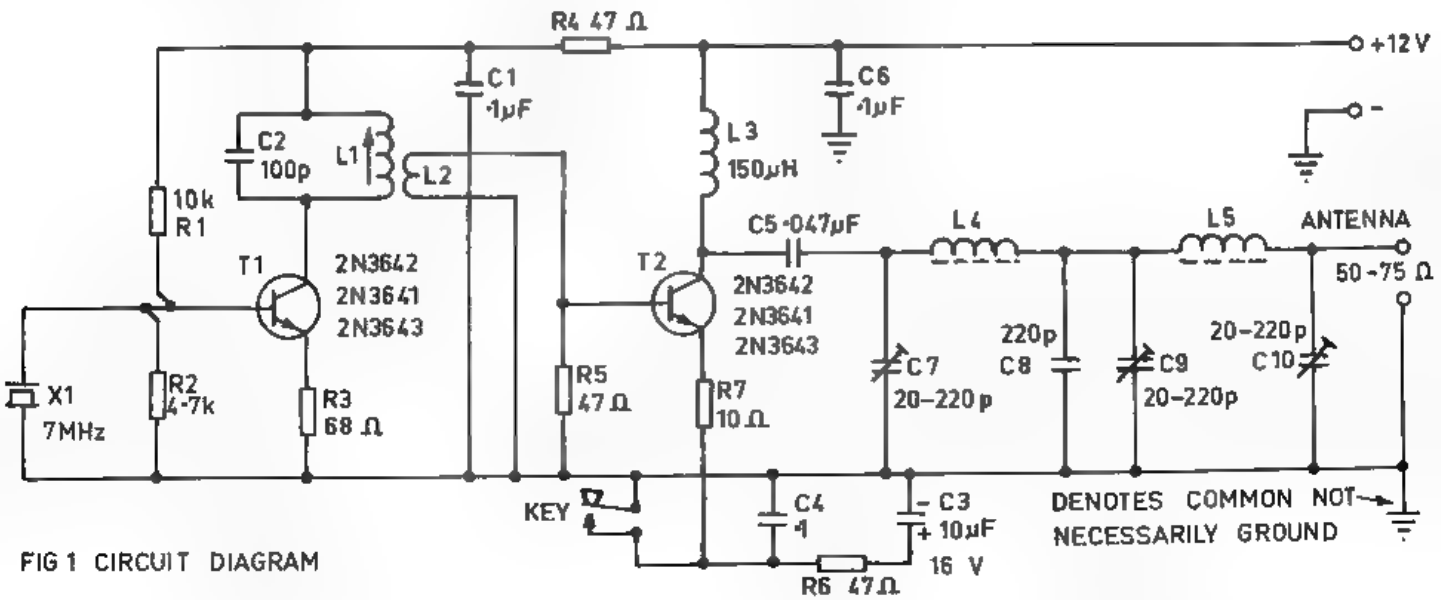


FIG 1 CIRCUIT DIAGRAM

10 x 5 cm. The components are soldered to the copper side of the board and drilling is unnecessary. Coax to the antenna connector is soldered to the left hand side of the board shown on the photograph. Tag board construction or matrix will also yield satisfactory results if circuit board working facilities are not available

The toroidal coil formers used at L4 and L5 are not easy to obtain, as it is necessary to order a minimum quantity of ten from the supplier. (I bought a number of these formers for this project and will be pleased to post a pair to any intending constructor for the price I paid, 40c plus postage please.)

Any active 7 MHz crystal in the CW band (7000 to about 7040 kHz) may be used at X1. Operation of the crystal oscillator can be checked before the components of the output stage are soldered into place. Tune the station receiver to the crystal frequency and adjust L1 for maximum signal consistent with re-starting of the oscillator with removal and re-application of the 12V supply. The components of the output stage can now be mounted into place.

To test the completed circuit, connect a 6 volt, 100 mA lamp across the output, or better still, a 56 ohm 1 watt resistor and X10 probe and CRO, with a bandwidth greater than about 10 MHz. With the key circuit closed, adjust L1, C7, C9 and C10 for maximum output. The lamp should glow at almost full brightness when the circuit is operating correctly. The character of the keying may sound a little chirpy with the lamp load, but that is because the load variations of the lamp are reflected through the output stage to the oscillator. With a pure load (resistor or antenna) there is no chirp and keying sounds quite good.

If you have been using high power and feel you need a little adventure, this little QRP rig may provide it. ■

A WIDEBAND RF TRANSFORMER

Ivan Huser VK5QV
5 Mugford St., Mount Gambier, SA 5290

A transformer suitable for matching the input of a passive grid linear amplifier to a transmitter or transceiver.

If one looks at the circuit diagrams of passive grid linear amplifiers it will be seen that the input swamping resistor is generally in the order of 300 ohms. Thus, if fed by coax directly from a transmitter or transceiver, a mismatch will occur with a resultant high standing wave ratio between the two units.

This problem can be overcome by using an RF transformer having a 2:1 turns ratio (4:1 impedance ratio) between the input socket of the linear amplifier and the swamping resistor in the tube grid circuit.

If 75 ohm coax. is used, a swamping resistor of 300 ohms will give an SWR of 1:1 on all bands. For 50 ohm coax. a 220 ohm resistor should be used.

FIG. 1.

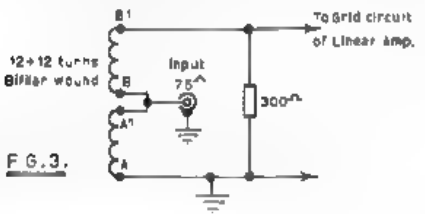


FIG. 3.

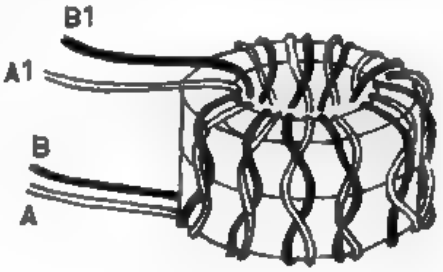


FIG. 2.

The construction of the transformer is quite straightforward. The original was wound on two Ducon Q2 ferrite rings having an outside diameter of approximately 18 mm stacked one upon the other.

Two lengths of 7/.0076 PVC hook-up wire were twisted together to give about two twists per inch length as shown in Fig. 1. The twisted pair was then wound tightly around the toroid to give ten or twelve turns (see Fig. 2). The exact number of turns does not appear to be too critical.

If two different coloured wires are used, it becomes a relatively simple task to connect the transformer as shown in Fig. 3. It should be noted that this transformer is *NOT* a balun since both the input and output are unbalanced. Although not tried on 160m, I can see no real reason why it should not work satisfactorily on this band also.

Mounting and/or potting of the transformer is left to individual tastes.

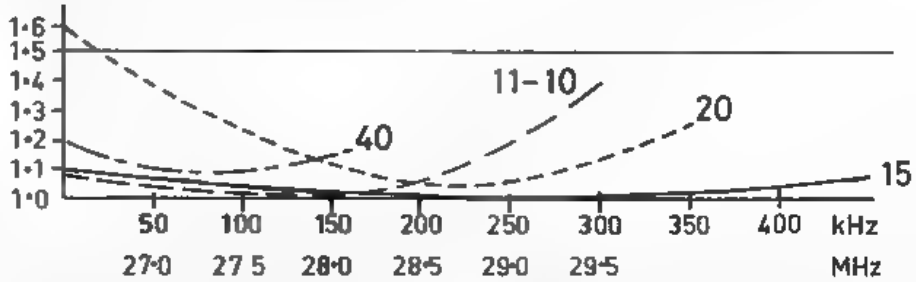
This transformer would be quite suitable for use with the G2DAF/VK5MS linear amplifier described in the May 1974 issue of Amateur Radio. ■

OPTIMISE YOUR 14AVQ

Hans Smit VK2BHS
9 Moore Cres., Fau.conbridge, NSW 2776

The ubiquitous 14AVQ trapped vertical antenna can be optimized for operation on five Australian bands quite easily with two simple modifications.

1. Shorten the distance between the 10 metre trap and the 15 metre trap to 5½ inches. This involves cutting about 2 inches off the connecting tube and about 1 inch off the bottom of the 15 metre trap.
2. Lengthen the top section to allow it to be adjusted to 78 inches. Insert an extension piece (flat ½ inch plated steel bent at each end and drilled, about 4 inches long) between the top section and the capacity hat. Bend the three aluminium wires up, to add a further 5 inches of height to the antenna.



Now adjust the antenna, using the key letters for dimensions referred to in the instruction leaflet. A — 29 in, B — 7½ in, C — 12 in, D — 5½ in, E — 12 in and F — 78 in (plus the additional 5 in. gained by bending up the capacity hat wires).

Make sure that the ground system is effective. If you have a flat steel roof, as is the case at this QTH, solder all the sheets together with short lengths of braid or thick wire.

The following SWR curves were obtained with the bottom of the antenna mounted 6 in. above the flat steel roof. ■

NEWCOMERS NOTEBOOK

with

Rodney Champness VK3UG
and David Down VK5HP

A NOVICE TRANSMITTER — Part 3

THE MODULATOR

The transmitter has been designed so that the modulator can be added at any time to the basic CW transmitter. The modulator described in this article is capable of putting out about 6 watts of audio which will modulate a transmitter with a DC input of 12 watts to the plate and screen of the output valve. However, the DC input to the final consists of the DC used in the screen as well as the plate circuit. The DC used in the screen can be as high as 20 per cent of that used in the plate circuit.

The modulator can therefore not be expected to modulate a transmitter with more than about 10 watts plate input. The modulator is capable of modulating the carrier to 120 per cent in the positive direction and 85 per cent in the negative direction, which means the transmitter is more effective than some other transmitters of considerably higher power.

The audio quality of the modulator is quite satisfactory and the distortion figures come out at 8 per cent, which is quite acceptable for a piece of equipment in this category. A ceramic microphone is used to maintain the overal speech quality. The frequency response of the modulator has been tailored to be substantially flat from 300 Hz to 3000 Hz and is down by about 6 dB at both of these points relative to 1000 Hz response. The components responsible for the speech frequency shaping are C14, C15, C16, C17, C18, C19, C20, C22, R18, R23, and R24. For example C14 and C15 have opposite effects on the frequency response of the particular stage — C14 with R18 acts as a low pass filter attenuator, whilst C15 with R20 acts as a high pass filter and attenuates frequencies below about 300 Hz. C14 also acts as an RF bypass in the front of the modulator.

Valve stage V2 amplifies the weak signals produced by the microphone by about 300 times and then applies these to the modulator output stage V3. These voltages are built up in this stage to approximately 500 volts peak to peak, enough to fully modulate the RF section of the transmitter. All the DC valve operating parameters were extracted almost entirely from the various valve data books; the signal coupling components are the things which were calculated for this particular amplifier/modulator requirement. The modulation transformer is a push-pull speaker transformer of the cheaper replacement type rated at about 5 watts. Approximately 300 volts DC is placed on the plate of the 6BQ5 modulator valve. When it is driven by the 6AU6 the plate current is made to fluctuate at an audio rate. When the input voltage to the grid of the 6BQ5 is swung in a positive direction, this causes the plate current to increase because the valve has less bias. As this action is occurring at an audio rate the transformer T1 acts as a choke at audio frequencies preventing the valve from drawing much more current than normal, and by so doing the plate voltage drops to a low value — theoretically to zero. However, when the drive from the 6AU6 is in a negative direction, the valve will tend to cut off and T1 again acts as an audio choke but in this case it tries to maintain the current drawn by the 6BQ5 at a constant rate so the voltage at the plate end of the transformer increases to something like 600 volts.

This swing from zero volts to 600 volts at the modulator plate end of the transformer does not in fact occur if the modulator valve is to be operated in Class A1 which it is in this transmitter. The voltage swing is limited to 60 volts DC to 540 volts DC, which works out to a swing of ± 240 volts about the 300 volts DC at the plate of the modulator. If the swing is only 240 volts either side of the resting DC voltage, it is necessary for the transmitter RF section to be supplied only with 240 volts DC HT voltage otherwise 100 per cent modulation will not occur. The DC voltage must be swung between zero and twice supply by the modulator audio output, and this is approximated in this transmitter. To accomplish this it is necessary to drop the HT voltage on the RF output stage to 240-250 volts and R28 does this. The 480 volts peak to peak audio must not be attenuated by R28 so C22 bypasses this resistor to make sure the peak audio is applied to the final RF valve. T1 is a 1 to 1 speaker transformer. The DC currents in T1 are in opposite directions so their magnetising currents largely cancel and T1 does not become magnetically saturated. The secondary winding on T1, the normal speaker winding of 3.5 ohms, is used for monitoring purposes in the companion receiver section.

Some may think that the relay shown in the circuit diagram of the modulator serves no useful purpose — but it does. In conjunction with R27 the relay shorts out the electrolytic capacitors in the modulator and receiver on changeover from transmit to receive and vice-versa. If these capacitors are not shorted out on changeover enough charge will be left in them to cause both transmitter and receiver to operate momentarily together and probably cause some acoustic feedback. The time for C21 to discharge through R27 is of the order of 0.1 milliseconds with a value of 10 uF for C21. The momentary discharge current through the relay contacts and the resistor is of the order of 2.5 amps. Without the resistance the relay contacts could easily weld themselves together, so it is not recommended to delete this seemingly insignificant resistor. It may be that in some cases this anti-acoustic feedback circuit is not required.

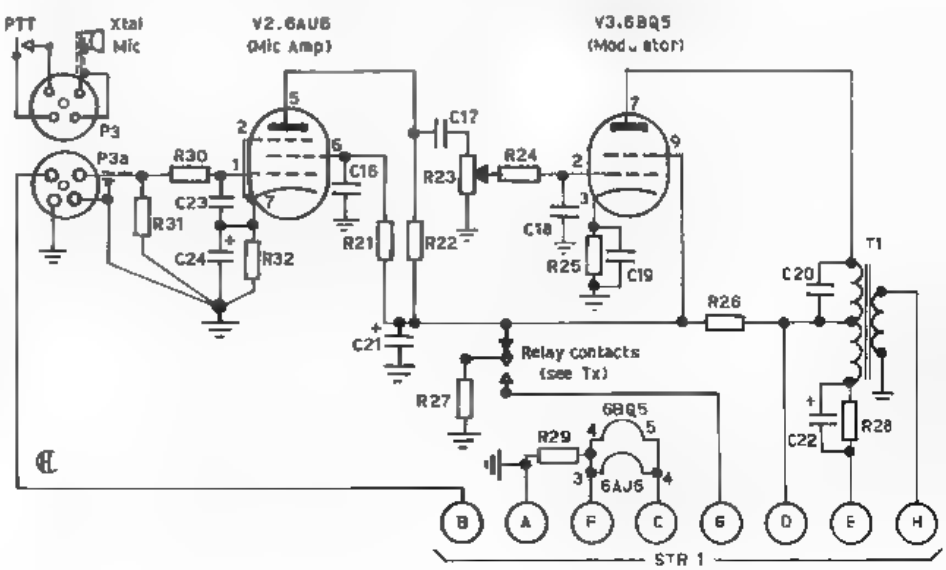
Press-to-talk facilities for the transmitter are extended via the microphone to the plug and socket and then to relay control circuitry which has previously been described. At this juncture it is probably advisable to point out that the terminal strips labelled STR1 in the transmitter and modulator circuit diagrams are meant to mate, i.e. A connects to A, etc.

The voltages which will appear in the modulator are tabulated below:—

Valve	Cathode volts	Screen volts	Plate volts
6AU6	+1.5	+65	+45
6BQ5	+6.6	+250	+300

These voltages are subject to variation due to component variations, supply voltage variations and individual valve variations, but are near enough for practical purposes.

MODULATOR FOR 10 WATT TRANSMITTER.



The next two months should finish the transmitter description, and will include a practical chassis layout, any modifications to the transmitter which may improve its performance, or extend it, and a simple aerial tuning unit which may be useful.

COMPONENT LIST FOR MODULATOR OF THE 10 WATT 80 METRE NOVICE TRANSMITTER

R21 — 1M ohm ½ watt, screen voltage dropping resistor

R22 — 0.47M ohm ½ watt, plate load resistor, valve output voltage is developed across this resistor

R23 — 1M ohm potentiometer, gain control for the modulator. A fixed resistor can be used here if R24 connects to C17. This is the grid return resistor

R24 — 100k ohm ½ watt, grid stopper and part of audio low pass filter.

R25 — 135 ohm 1 watt (2 x 270 ohm ½ watt in parallel) cathode bias resistor

R26 — 10k ohm 1 watt. HT decoupling and voltage dropping resistor

R27 — 100 ohm ½ watt, used to discharge receiver or transmitter HT line to earth when particular section switched to stand-by. Value not at all critical, up to 1k ohm satisfactory.

R28 — 1k ohm 3 watt wire wound resistor or 3 x 2.7k ohm 1 watt resistors in parallel. HT voltage dropping resistor for PA valve.

R29 — 39 ohm (2 x 82 ohm 1 watt in parallel or a 6.3 volt 0.15 amp pilot lamp) Used to balance the voltage across the series-parallel valve heater network.

R30 — 100k ohm ½ watt, grid stopper and portion of audio low pass filter. Also acts as a suppressor to RF voltages and currents being impressed on the grid of V2 and so causing audio distortion.

R31 — 2.2m ohm ½ watt, grid return resistor for V2 and load for the high impedance microphone.

R32 — 2.2k ohm ½ watt. cathode bias resistor for V2.

C16 — 0.022 uF 400 volt polyester or similar capacitor. Screen bypass, value helps with the shaping of the modulator audio passband.

C17 — 0.001 uF 400 volt polyester or similar, coupling capacitor from V2 to V3, acts to restrict the low audio frequencies passing through the modulator

C18 — 390 pF ceramic disc capacitor, used for frequency shaping, restricting the passage of highs through the modulator

C19 — 5 uF 25VW electrolytic, cathode bypass, used to attenuate the lower frequencies.

C20 — 0.01 uF 400 volt polyester or similar, used to attenuate the higher audio frequencies, can be omitted from the circuit with no problems.

C21 — 4 uF to 24 uF 350VW electrolytic, HT bypass to prevent feedback in the modulator and reduce hum on the modulated signal.

C22 — 4 uF 160VW electrolytic, passes audio around DC dropping resistor R28, Improves modulation percentage of the transmitter, also restricts the passage of the lower audio frequencies.

C23 — 390 pF ceramic disc capacitor, used for audio frequency shaping and bypassing of RF induced into the first audio stage from the transmitter

C24— 1 uF 10VW electrolytic, cathode bypass for V2 aids in attenuating the lower audio frequencies.

J3 — 5 pin miniature socket for the PTT microphone.

P3 — 5 pin miniature plug to suit above.

XM1 — Crystal, ceramic or high impedance dynamic microphone with press-to-talk facility.

V2 — 6AU6 high gain sharp cut-off pentode valve.

V3 — 6BQ5 high gain audio output valve.

T1 — 10k ohm plate to plate replacement push-pul speaker transformer. Exact impedance not over important.

REL — See transmitter details in September issue.

Miscellaneous hook-up wire, tag strips, solder, shielded cable, nuts and bolts, valve sockets, metal for chassis and brackets, labels and paint, also required. ■

20 Years Ago

with Ron Fisher VK3OM

NOVEMBER 1955

'Nation Shall Speak Peace Unto Nation'. The late Don Knock VK2NO suggested that perhaps instead of super power broadcasting stations taking up shortwave space, more frequency space should be handed over to amateurs so that the youth of all nations could do just this.

From the technical point of view, the November issue belonged to Hans Ruckert VK2AOU. Part two of 'A Transmitter With Low Harmonic Output' plus 'Anti TVI Filters for the Amateur Transmitter' Hans showed how to design and align low pass filters suitable for connection in the output coax line of a typical amateur rig, plus information on the design of AC line filters.

Back in 1955, VHF receivers did not usually include automatic band scanning. However, not to be outdone, Dr H. A. F. Rofe VK2HE attached an AGC controlled motor to the tuning dial of his receiver. The whole thing was described in an article entitled 'A VHF Automatic Tuner'.

Most amateurs give little thought to lightning protection until it is too late. An article reprinted from QST gave examples of just what should be done to avoid serious trouble.

An interesting account of the formation of a communications net for the marathon events of the forthcoming Olympic Games showed just what could be achieved with two metre gear at the time. I am not sure if the net actually operated during the games or not.

If you follow the Hamads column try a few of these from November 1955. An AR7 complete for $70. Or how about an RAAF scope for $30. No, well perhaps you could be tempted with five 828 tubes at $2 each. ■

IARU NEWS

Word has been received that the Minutes of the Region 3 Hong Kong Conference have been completed and are on the way to us by sea mail. All the more important items are likely to have been dealt with already at the 1975 Federal Convention.

The NZART Golden Jubilee will be marked next year by a Conference in Auckland. The dates are 4th to 7th June, 1976.

If any amateur has plans to visit New Zealand "some time or other, maybe next year" or indeed intends to visit Kiwiland next year anyway the provisional programme certainly caters for all tastes. A world renowned Scientist will be a guest lecturer, there are social evenings and luncheons, a mobile rally, fox hunt, coach tours around New Zealand before and after the conference, and even a creche for children.

With the recent devaluation of the New Zealand dollar this is certainly a popular holiday area nowadays. When you have a willing band of New Zealand amateurs ready to assist with advice and organisation for a bonus such as this Convent on it is difficult to see how anyone could pass up this golden opportunity for a most congenial and economical break from everyday chores.

The oldies are to be catered for as at least 7 of the original founders of NZART are expected to be present. Marion Lister writes that youth will also be catered for as well as VHF. Repeaters will be in operation, she says, so take the hand-held transceiver with you for which a licence is necessary. Take photocopies of your licence and arrange for forms to be completed in advance.

Accommodation etc. will be through Avis Ltd and it seems that Air New Zealand will also take bookings and arrange group tours.

If you are interested in this once in a lifetime scoop why not get further details by writing to Marion Lister, ZL1BKL, the organising secretary at P.O. Box 23-680, Papatoetoe East, Auckland, New Zealand.

All the above information kindly provided by David Rankin, 9V1RH, Region 3 Secretary. ■

Commercial Kinks

with Ron Fisher VK3OM
3 Fairview Ave Glen Waverley 3150

This month it's back to the FT200. It seems incredible that modifications keep coming in for this rig I often wonder where it will finish.

John Adcock VK3ACA has come up with improved CW performance for the FT200.

"I would like to offer some simple methods of improving the usefulness of the FT200 on CW. These modifications may be equally applicable to other transceivers.

The FT200 falls short of my idea of a good CW rig in the following ways.

1. The final was designed for class AB1 operation and therefore is inefficient on CW.

2. There is no netting facility when using a separate CW receiver, and

3. It is impossible to zero beat when transceiving. This is because the transmitted carrier is shifted inside the band pass of the filter on transmit but on receive the beat frequency is not shifted.

Consider the first point. In the CW position the final is operated under 'saturation' conditions and the input to the final is excessively high.

The plate current can be reduced by reducing the loading. Under this condition there is a tendency for the tuning capacitators to flash over A common modification is to reduce the drive in which case the final will operate correctly in class AB1. This will reduce the plate current but the efficiency is very low.

The method suggested here is to increase the bias on the final. This will reduce the plate current and allow the final to operate in class C at the same time. This can be done by adjusting the bias resistor VR 103. However it is now necessary to readjust the bias resistor each time one returns to SSB. The best solution is a second bias adjustment. This is done by placing an extra resistor VRx in series with the bias line (see Fig. 1). Here a 50k variable carbon pot appears to be satisfactory. When the resistance of VRx is increased the voltage bias to the final will rise.

Ideally this resistor should be switched in with the function switch in the CW position only. Unfortunately I have not discovered a simple method of doing this.

The pot VRx can be mounted at the right hand end (viewed from the back) of the row of pots. By carefully following the wiring it is necessary to run only a few

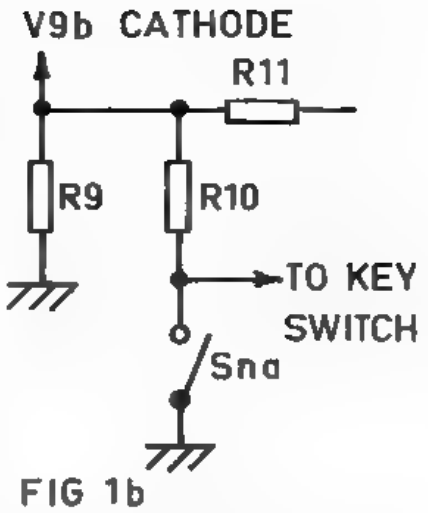


FIG 1b

short lengths of wire to the printed circuit board.

To operate the new facility, when in the transmit CW position with the key down, rotate the new pot until the plate current is at a satisfactory value. 250 mA gives 150 watts input (do not hold the key down too long). When returning to the SSB position rotate the new control to the zero resistance position.

The second and third modifications are now considered. The switch Sn in Fig. 1a and 1b is a netting switch and the switch Ss in Fig. 2 is a shift beat frequency switch. These were mounted to the right (above and below) of the mike gain control at the right hand side of the panel. Time and space do not permit a detailed description of the physical wiring except to say that it is not difficult to place.

The switch Sn was an NKK Sb2061 DPDT press button type. Ss is an NKK SPDT toggle with only one pair of contacts used. The purpose of the net switch is to turn on the transmitter except for the final and thus provide a carrier for netting in an adjacent receiver. Sna will operate the relay system to turn the receiver off and turn the transmitter on. Snb maintains the maximum blocking bias on the final. There should now be ample carrier for netting a second receiver.

The switch Ss will cause the carrier crystal to shift in the receive position as well as the transmit, with the function switch in the CW position only. When tuning in CW, the clarifier can be left off or in the O

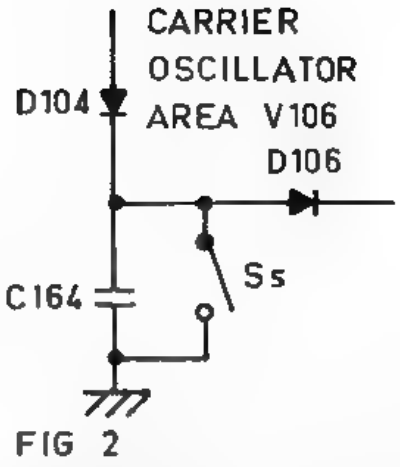


FIG 2

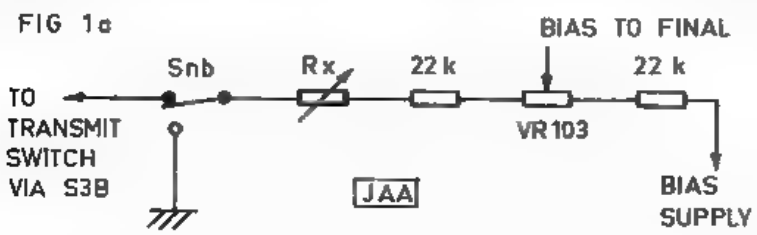
position and the incoming signal set to zero beat. Now the clarifier can be adjusted to the desired pitch. The switch Ss can now be left on or off as desired. The transmitted signal will now be zero beat with the received signal.

Some thoughts in the use of the switch are as follows. Using the switch is the only way you can be sure your transmitted signal is zero beat with the incoming signal. In the on position it does allow the CW to be copied at a lower pitch than is usually possible. This is sometimes an advantage under QRM conditions.

There is some feed-through from the beat oscillator to the AGC detector and this will cause a smal shift to the "S" meter and some de-sensitising of the receiver. This may be undesirable on weak signal bands such as 21 and and 28 MHz. Also the switch should not be used when receiving SSB and transmitting CW

Since all these modifications are independent of each other, any one or all can be tried". ■

FIG 1a



Sn= DPDT PRESS BUTTON CHANGE OVER SWITCH

BOOK REVIEW

GUIDE TO AMATEUR RADIO' by Pat Hawker G3VA
It is my pleasure to review the 16th edition of **Guide to Amateur Radio** which has just been published by the **Radio Society of Great Britain.**
The highly readable text is supplemented throughout by extensive use of diagrams, photographs and tables making the book one of the most compact reference sources on this subject available. Naturally the book is intended for interested people in Great Britain but most of the text is applicable to Australia. The chapter titles are (1) This is Amateur Radio; (2) Getting Started, (3) Communications Receivers, (4) Amateur Transmitters; (5) The Licence Examination (6) Operating an Amateur Radio Station, (7) Workshop Practice; (8) Amateur Radio Equipment, (9) The RSGB and the Radio Amateur.

The only sections not applicable here are Chapters 5 and 9 and in the latter, **WIA** can be nearly written in, in place of **RSGB**. The Licence exam is significantly different here in Australia. Chapter 7 is one of the best I have read on Workshop Practice. All in all I could not do less than recommend it to those who read, and those who should read. **Newcomers Notebook.**

Rodney Champness VK3UG ■

SPECIAL ACTIVITY STATION
ZS4BD writes that the special call sign ZS4OIL will be activated to celebrate the 25th anniversary of South Africa's oil-from-coal plant at Sasolburg.

Contests

with Jim Payne, VK3AZT
Federal Contest Manager,
Box 67, East Melbourne, Vic., 3002

1975 REMEMBRANCE DAY CONTEST RESULTS

	a	b	c	d	e	f
VK5 & 6	216	843	26	1642	53335	18140
VK4	126	781	16	1755	55421	10838
VK7	44	238	18	842	11830	3029
VK1	29	126	23	855	6355	2778
VK2	89	2220	4	1361	30519	2596
VK3	89	2122	4	859	23346	1838
VK8	74	526	14	1285	25838	1829

a—Logs received
b—Licences
c—Logs/Licences %
d—Average top 6 logs
e—Total score
f—Trophy score

DIVISIONAL SECTION LEADERS SCORES ARE SUBJECT TO FURTHER CHECKS

In the following detailed scores the first figures are the points scores and the second are contacts made.

STATE SCORES

VK1

Phone

VP	627	296	ZAR	182	182	ZBL	62	62
FT	582	280	ACA	182	100	ML	51	51
MF	438	206	ZMV	179	179	GB	36	13
LF	418	183	YR	174	165	ZWP	19	19
AH	275	160	ZJJ	148	148	ANR	18	18
WI	262	208	ZT	114	61	CR	16	14
RH	254	142	ZPH	73	73	PM	11	11
QJ	240	121	ZVT	69	69	JG/P4	39	16

Open

AOP	1338	558	EP	941	476			
CA	1208	528	ED	360	201			

CW

VK	82	8						

VK2

Phone

RG	1669	619	AJL	219	83	ZSG	70	70
XT	1268	473	BMX	213	85	BGS	66	28
AUY	696	348	JP	203	84	BJK	64	23
ANF	673	300	BWT	195	65	CF	58	22
NW	770	305	AGM	179	67	AWX	57	57
RW	750	265	RU	174	40	ABC	52	29
ATT	656	248	PT	154	46	RL	52	28
BMT	418	196	AMT	153	57	QC	51	25
RP	400	161	ASJ	142	54	YDO	39	39
OW	375	152	IN	125	35	JF	39	20
OH	351	152	BSG	121	47	AFA	38	10
BOB	328	140	BNR	101	52	BNI	23	7
ASH	312	100	JX	82	36	ADL	19	11
BNS	297	120	ZCT	80	60	AEC	16	7
RJ	291	126	BHD	80	20	LE	12	12
ALZ	285	100	AIB	77	33	AAC	12	12
AJM	282	101	ZVN	76	76	ZVY	9	9
NZ	261	176	AOZ	73	28	YDT/		
UJ	237	104	AAI	72	31	P4	119	119
PN	231	61	FJ	71	31			

Open

BO	1571	469	AFG	587	265	HZ	148	30
DM	1156	419	BLK	484	133	AJO	146	30
AHM	1082	398	PU	341	104			
CAX	958	298	HQ	201	59			

CW

CX	1392	240	TR	564	110	BET	182	29
GR	1214	219	VM	559	100	ZC	132	30
QL	892	150	BHO	538	110	IV	124	41
BNL	876	155	JY	382	81	AXK	74	10
HW	782	120	KM	306	51	WE	72	17
XQ	656	112	ADR	200	25	BBB	56	10
YB	606	108	II	194	45	AND	30	9

VK3

Phone

HT	975	534	ANP	230	123	NV	76	29
AYF	[illegible]		ZD	213	106	QZ	75	36
DF	[illegible]		AIZ	190	78	AYP	71	31
CX	801	411	ZMP	184	185	ZOQ	70	70
OK	[illegible]		VQ	180	82	ALL	67	24
ADW	650	325	YIG	178	178	SX	66	45
RV	599	266	BCH	173	100	AL	60	18
BKW	598	426	EF	155	82	AJP	55	31
AQZ	566	330	AAJ	148	80	ZJS	52	52
AMK	555	272	ZLW	138	138	APV	47	20
LP	514	263	YBZ	136	136	HE	41	26
ARY	512	248	YIE	136	136	RN	36	19
YQ	488	214	ASN	128	71	AJ	31	23
ALK	423	250	YF	125	69	KS	30	10
AXV	416	200	WM	124	56	AGD	28	18
SR	413	206	ZND	116	116	AXU	28	14
QG	364	170	ZBY	115	115	ZVN	18	18
SM	331	151	RF	110	38	AVO	17	17
XF	316	160	BJM	108	108	HZ	17	14
AIE	308	174	WT	105	37	ZZU	16	15
BEK	307	307	ARO	103	49	BCZ	11	7
ABP	240	115	AIS	96	56			

Open

WW	609	412	AKS	387	191	UV	188	111
AYL	740	364	XB	358	125	LV	157	114
GX	717	501	PR	353	131	EZ	57	28
CM	532	135	ARS	259	118	AJA	22	13
AUQ	395	252	VF	227	88	ALS	16	9

CW

KF	554	128	APN	208	62	AMD	114	25
FC	536	152	TX	203	80	NK	72	43
DG	224	98	ARK	146	42	RJ	22	11

VK4

Phone

ZQ	2273	905	FE	356	146	FX	81	28
FH	1493	540	OX	329	114	PU	77	30
YS	1254	446	JG	337	115	HZ	77	27
LB	1117	422	RP	327	87	ZCG	75	75
VV	1073	464	CZ	310	109	NS	71	39
NY	[illegible]		HB	306	110	LA	71	17
ZT	1014	350	OB	298	100	RL	66	42
DO	953	358	LW	293	116	ZLD	65	65
MM	950	371	NQ	288	83	EH	65	56
LP	914	320	IJ	281	140	ABR	60	30
PX	908	317	CW	276	103	HD	59	16
EZ	[illegible]		CY	273	100	ZPG	57	57
LZ	846	303	AQ	252	101	FU	54	28
KW	843	331	IC	238	84	QT	47	23
BR	[illegible]		GM	234	124	CR	46	19
MW	734	242	ZBV	211	211	ZDC	45	45
OW	731	400	ZGR	196	196	PV	42	16
TE	707	250	ZRF	193	193	SN	33	10
LE	688	227	DK	187	61	PM	28	14
VU	657	302	BG	184	48	MJ	23	12
PJ	643	266	ZSH	166	166	XZ	23	9
AAL	541	177	WIG	166	73	HX	21	15
JP	515	126	VS	143	65	GT	21	11
UU	511	137	UG	113	24	ZTJ	20	20
AAU	504	147	ZJC	105	105	AZ	16	7
ABJ	474	211	DZ	89	37	ZAF	13	13
QO	473	181	ED	87	29	XY	10	10
ZB	471	153	HW	85	25	ZMI	9	9
TK	428	196	XN	85	20	DV	8	8
FN	428	174	ZNI	84	84	XT	6	6
KZ	415	141	ZTD	83	83	BC	5	5
FQ	408	153	ZCL	81	81			

Open

UR	1634	511	LT	1235	293	HJ	411	154
UX	1763	528	AAR	1219	400	UA	394	94
RN	1596	469	CCR	686	306	FJ	230	68
AAT	1373	439	PS	517	176	RF	144	50
HE	1353	344	DI	482	180	II	16	5
YG	1273	405	WL	472	105			

CW

ABA	1574	270	AXJ	332	50	NJ	103	42
KX	1188	190	SO	268	46	CN	68	9
GH	692	129	AAF	248	38	SF	40	12
XA	618	124	PB	238	47	AW	50	8
HH	414	63	PN	200	31			
XJ	356	51	OK	150	31			

VK5

Phone

QX	1732	741	AD	232	169	KF	63	20
BI	1504	555	XU	228	81	BF	61	30
SU	1428	516	XI	227	66	YR	67	67
EN	1297	511	KH	222	75	ZPP	60	60
BW	1239	468	HN	217	110	TU	59	59
DV	1124	513	RI	210	74	NT	58	16
NB	995	588	ZAQ	203	203	PB	57	33
CU	987	430	ZAW	200	200	ZLK	54	54
FT	967	364	CL	200	79	MT	54	31
NZ	936	424	ZPJ	197	197	MG	54	25
ZT	920	427	OK	189	83	WH	54	24
NX	884	409	FQ	179	61	GD	54	20
WV	861	318	SC	177	57	HD	53	17
KK	850	460	ZLH	173	173	ZNN	51	51
FD	793	317	ZAC	167	167	WS	42	17
QV	788	299	OC	166	51	XN	40	16
HI	781	250	IL	163	58	WA	39	15
KR	756	360	FL	159	46	ZPW	36	36
ZZ	752	271	NF	156	53	GY	35	11
SU	724	386	ZQ	153	99	EU	34	29
KG	707	303	QZ	151	58	ZJJ	33	33
WI	686	319	PQ	150	68	CA	33	12
LL	656	247	ZGP	150	150	ZBM	31	31
BQ	657	256	ZJP	148	148	ZGZ	30	30
ZK	655	316	MA	145	50	ZMR	30	30
CY	636	255	ZMH	138	139	ZEE	29	29
US	613	212	QP	137	119	DO	29	11
ZB	529	174	TO	130	57	WG	29	10
DI	518	161	ZJB	129	129	PN	28	11
EF	505	179	ZBJ	120	120	ZTX	27	27
LN	492	200	ME	120	50	ZSJ	26	26
SS	468	162	TW	120	49	KS	26	17
WR	450	225	VB	116	30	ZKT	24	24
WB	435	265	DF	107	30	PI	22	17
VT	428	189	LC	106	31	SE	21	21
ZDD	378	378	ZLA	105	105	FH	21	7
YW	373	181	OW	104	34	WM	20	11
EJ	371	160	RR	103	37	ZR	18	11
NN	367	143	GX	102	102	OE	18	10
RV	352	134	XV	101	30	YY	16	11
LP	330	123	SD	94	36	GJ	16	7
ZBI	329	329	GO	93	40	QI	15	6
NA	326	174	FA	90	35	ZTT	15	15
MF	323	112	GF	85	29	ZGS	13	13
ZCF	313	313	ZG	83	26	FO	13	9
ZSA	310	310	ZKK	82	82	ZAS	12	12
ZAJ	293	293	GN	80	28	AG	10	10
ST	288	155	ZJA	79	79	JF	10	10
CH	287	102	QH	75	46	ZIG	9	9
KT	280	138	IM	75	30	GZ	8	8
TY	277	120	AC	75	22	ZNJ	8	8
ZVQ	265	265	ZAP	73	73	ZFM	8	8
ZU	257	61	FZ	70	70	ZFJ	7	7
ZWR	255	255	ZIB	68	68	ZJV	6	6
WN	245	100	ZBC	66	66	TQ	6	6
YH	233	100	GL	65	65	ZLO	5	5

Open

RG	1736	640	AX	422	158	LU	123	33
IF	1097	428	FH	408	108	ML	83	28
MM	851	304	LQ	379	139	ZS	98	55
LM	803	301	EM	298	222	JT	98	45
RY	548	172	PX	249	150	OT	55	12
NJ	430	158	HM	236	60	DS	49	15
PK	426	126	AWI	170	131			

CW

NO	1339	244	NM	410	84	FY	140	21
LI	856	155	KJ	400	76	HO	100	26
DL	856	154	FG	287	63	KU	100	22
HP	836	148	MO	286	54	UE	76	12
SW	886	154	RX	212	30	KY	48	10
OR	874	158	XD	196	31	JG	32	7
MY	696	136	FM	194	41	LB	20	7
KL	598	104	QR	176	30			
QQ	582	111	AU	152	27			

VK6

Phone

KG	1782	712	HA	509	340	WL	239	117
KW	1455	581	FP	464	185	DCI	230	102
CF	1011	391	CO	421	143	BV	218	101
DA	1003	496	AN	383	226	DY	214	120
AO	788	316	MR	367	210	LV	214	114
VP	613	240	MO	335	101	LG	204	168
ZZ	607	169	DG	334	137	DD	186	100
OR	569	223	EG	289	116	TX	183	63
BD	513	239	EB	246	112	DX	161	110

ST	160	69	PS	95	69	CN	40	40
MF	135	56	HU	88	88	DZ	40	19
MB	127	60	QR	88	88	XX	37	12
AV	108	40	SH	86	86	CD	30	11
ZIW	104	104	ZDA	70	70	WD	18	18
BY	104	75	ZLR	65	65	MM	7	7
ZHJ	103	103	ZJD	63	63	GV	7	7
PL	102	102	KC	58	22			
GL	98	40	RH	58	58			

Open

ED	1233	405	QJ	392	100	EJ	91	23
MA	1112	290	HX	326	75	KB	86	30
FI	1021	344	RU	315	89	HD	28	10
ZE	711	200	HK	297	108	CT	24	5
PN	477	182	RL	250	61			
WA	423	151	TU	203	72			

CW

WT	882	175	HQ	590	122			
AQ	834	184	ZO	210	44			
RS	758	150	OH	188	35			

VK7

[redacted]

JV	874	359	ZMM	98	98	KS	50	50
TT	637	309	PS	96	82	AI	40	12
MX	599	239	ZMC	68	68	KK	65	34
KH	438	178	ZGJ	67	86	ZAK	32	32
SF	437	209	AW	86	49	DK	25	9
GW	379	102	AX	80	43	ZFR	22	22
DW	368	110	AB	80	34	JD	13	10
AK	187	50	BJ	66	42	CF	12	8
BM	183	100	IL	67	21	ZDF	8	8
JU	166	95	CT	64	23			
JA	161	44	ZWX	61	61			

[redacted]

BC	1393	468	RH	572	309	PF	331	105
CID	843	175	ZZ	468	100	AL	266	67

[redacted]

RO	678	181	JB	208	50	ZO	66	24
HE	676	141	GV	190	27			
CH	600	70	YL	82	19			

VK8

Phone

FB	1804	699	AS	1048	667	CEG	79	39

Open

ZZ	1033	203						

CW

HA	456	78						

P29

[redacted]

WB	1502	392	MJ	1389	358	DM	801	210

Open

EJ	97	26						

ZL

[redacted]

1BKX	990	269	2AUS	1241	323	3ABC	379	103
1AQO	375	136	2GJ	518	141	3BK	134	40
1AGO	313	84	3SZ	843	231			

Open

1ACL	1413	304	3GG	700	156			
1GO	1049	156	4IJ	225	58			

[redacted]

4BE	976	131						

RECEIVING

VK2	G. W. Parish	352	158
VK3	L.30042	844	157
VK4	L.40539	1023	420
	L.40502	575	182
	L.40506	441	162
VK5	R. C. Whitford	1726	682
	L.50605	1276	369
	L.50122	262	122
	N. Dobson	248	77
	R. Warrington	31	31
	L.50096	8	8
VK6	M. Byrne	1543	433
	J. Byrne	757	247
	M. Long	119	119
	L.60213	41	20
VK7	P. J. Hall	1010	430
ZL	2-129	554	141

CHECK LOGS

VK	3ARK
	XZ
	4RU
	5HW
	5JX

[redacted]

At the time of writing this there are numerous piles of logs stacked on the living room table. North Melbourne has just won the Victorian League Football Premiership, I have completed the move to QTH to Yarra Glen, the foundations for the new house were poured this morning and consequently there should be some time now to allot to the FCM's duties.

The comments which accompanied many of the logs reveal the very wide opinions concerning the essential conditions for a radio contest. Eric VK5LP commented "A truly excellent contest, conducted in a very gentlemanly manner, therefore it is a pleasure to operate".

Stan VK3AYF wrote that the contest gets better every year. VK3WW commented, "Congratulations on the new rules and am sure this will be the best ever for participation and pleasure" Harry VK4KW earned a good score and apologised, "Hope that you can copy this log OK as I am writing this in bed in hospital after an operation"

Murray VK4KX wrote among other interesting matters, "Congrats on the new rules, i.e. Rule 5 (scoring), b, c & d. Although not much help at present, could become very useful later on in sunspot cycle when the higher frequency bands come good". However a VK6 commented, "I was, as usual, looking forward to a busy contest weekend but, on reading the rules decided that the RD was now ridiculous. Simplicity must be the word for any contest if you want participation to increase. I am sure that the casual operator who may decide to have a bit of a go would have been put off by the complexities. If this is the sort of rules we can expect in the future I for one have submitted my last RD entry". A VK4, whose CW is impeccable, commented, "Your rules do not distinguish between the efforts made by those who put in 24 hours on the air, on 5 bands, both phone and CW, and those who merely listen in for ten minutes, so long as they both put in a score. You have created a contest which tries to be everything to everybody and which turns out to be nothing for anyone. Minimum effort by a maximum number does not make an interesting activity. I suggest that the RD contest is not a contest at all but merely an activity. Should its name be changed? You have set out to attract quantity participation, and you have succeeded. More incentive please, or nothing" Sam VK2BVS sent a long and very thought-provoking letter which among many other items suggested two types of calls. Call "CQ Contest" to indicate that you are working to maximise your score and want only short contacts or "CQ Friendly Contest" if you want prolonged contacts. Your comments will be considered, Sam.

Peter, who operates from a country QTH, expressed the views of many country amateurs when he wrote "I wish to protest about the recent changes in the RD contest as set out in the July issue of AR. I feel that the rule changes are totally discriminating against the country operator to the extent that the chances of a country operator winning a particular section of the contest especially in Vic. or N.S.W are nigh impossible given approximately even operators. The introduction of the VHF contact rule was moving in this direction especially when you consider the number of VHF operators within the capital city areas, but the doubling up of contacts on the LF bands is just too much"!

Thanks for this most informative letter, Peter Kerry VK5SU wrote that 20 m was best at his location, "Only one QSO on 15, that being to P29, nil on 10 or above"

VK3AIE (formerly VK8AZ) said he found the contest as much fun in Melbourne as in Darwin. 10 metres did not seem to be open anywhere He listened quite a few times but nothing heard. Jack VK2CX raises the real ham spirit in his comments, "I always enjoy any of the Australian contests, and I always take part in any contest just to repay my contribution to any country that takes part in any of our contests". Jack continued that particularly in the CW section of the RD the bands are dead between 2 and 6 a.m., and perhaps a break of 6 hours should be mandatory

Probably the youngest contestant was Nigel Dobson of Fulham, S.A. who submitted an SWL log Nigel is 12 years old. Another 15 year old, VK5KK D. Minchin, only had his call for 3 days prior to the RD. Dad had to share his gear while junior scored 850 points! And finally a few words about Victor R. P. Cook, VK5AC, who has been licensed for 63 years. In 1912 he was XVN, and as a foundation member of the WIA he must be among, if not the oldest, of the cat's whisker winders who sent in logs for this contest.

It is now obvious that the RD rules need a thorough review. The scoring takes into consideration the theoretical likelihood of making easy QSOs with the call areas with the most licensed amateurs. The results for many years past show that this does not occur VK6RS Ron has spelt it out, "I do think the latest scoring table is very equitable, but biased against us over here We have always had to give away many more points than we could possibly score, but this time it is much worse. I worked all comers as I should, and made 368 points, or as it was CW exclusively, 736. To gain these points I had to give away 709 on CW 1406. To give a VK2 five points to receive 2 means that for 37 stations worked I received 74 points and gave 185 away".

If you have ideas on the matter how about writing to the Editor of AR. Please do not write to the FCM as in the past some correspondents have complained when their views have been published in our magazine, and consequently suggestions received by the FCM cannot be made widely known. All that is wanted are a few simple rules!

CONTEST CALENDAR

Nov.	8/9	European RTTY Contest
Nov	9	Czechoslovakian
Nov.	8/9	ARRL CW Sweepstakes
Nov.	22/23	ARRL Phone Sweepstakes
Nov	29/30	CQ WW DX CW
Dec.	6/7	ARRL 160 metre
Dec.	13/14	ARRL 10 metre

Czechoslovakian Contest

0000 GMT Nov 9 to 2400 GMT Nov. 9th.

Rules remain unchanged. Phone and CW World wide contest with Czech stations having additional value. Exchange RS(T) plus 2 figures indicating your ITU zone. One point per QSO, 3 points if with Czech station. Contacts with own country permitted for multiplier credit but have zero QSO point value. Multiply total by sum of ITU zones worked on each band for final score. Mailing deadline Dec. 31st to Central Radio Club, Box 69, 113 27 Praha 1, Czechoslovakia.

CQ WW DX CW

0000 GMT Sat. Nov 29 to 2400 GMT Sun., 30th Nov.

No changes to rules. Suggest see magazine for details. Logs to reach CQ WW DX Contest, 14 Vanderventer Ave., Port Washington, L.I., N.Y., USA, 11050 by Jan. 15, 1976. Essential you show CW on envelope. ■

DX ITEMS

VK2BVS reports there is a 160 m net on 1.825 MHz after the VKZ Sunday morning broadcasts and, also via VK2BPX, that ZL2IG and ZL2ABF transmit on 1.884 MHz and listen for VK stations on 1.825 MHz at 2145h EAST Also that YJ8AM was worked on this band as well as VK3QI/VK8. CW is monitored continuously on 27.125 MHz to provide a link-up between operators on 10, 11 and 160 m nets. Several active stations on 28.5 MHz were also reported including HL9TG, VK6MB and a P29.

VHF UHF
an expanding world

with Eric Jamieson VK5LP

Forreston. S.A 5233

Times GMT

AMATEUR BAND BEACONS

VK0	VK0MA, Mawson	52.160
	VK0GR, Casey	52.200
VK1	VK1RTA, Canberra	144.475
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.080
	VK4RTT, Mt. Mowbullan*	144.480
VK5	VK5VF, Mt. Lofty	52.060
	VK5VF, Mt. Lofty	144.060
VK6	VK6RTV, Perth	52.300
	VK6RTU, Kalgoorlie	52.350
	VK6RTW, Albany	52.360
	VK6RTW, Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RTX, Devenport	144.900
3D	3D3AA, Suva, Fiji	52.500
ZL1	ZL1VHF, Auckland	145.100
	ZL1VHW, Waikato	145.150
ZL2	ZL2VHP, Mt. Stewart*	52.500
ZL2	ZL2VHF, Wellington	145.200
ZL2	ZL2VHP, Palmerston North	145.250
ZL2	ZL2VHP, Palmerston North*	431.950
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

* denotes change.

Some alterations to beacon listings this month. For a start the Mt Mowbullan beacon is operational again with its new call sign VK4RTT using 20 watts of FM

In a letter from Selwyn ZL2BJO comes news of the first ZL beacon on 6 metres, ZL2VHP, and I note they have had the very good sense to put it where we might hear it, namely on 52.500 MHz. The beacon runs 10 watts output with horizontal polarisation, keying 600 Hz -ve FSK. The antenna consists of crossed dipoles at 35 feet on Mt. Stewart, which must be somewhere near Palmerston North. Reports are requested from anyone hearing any of the ZL2VHP beacons, of which there are three listed herein, details to Selwyn Cathcart, ZL2BJO, 406 Featherston Street, Palmerston North, New Zealand. Their 70cm beacon has also been given a listing.

Other points of interest in Selwyn's letter concern VHF Field Days as follows. Sunday, 16/11/75: 2200 to 0200 GMT 6 metres only Saturday 6/12/75 0400 to 1000 GMT all bands, Sunday 7/12/75 1800 to 2400 GMT all bands.

QUEENSLAND NEWS

Very pleased to receive some news this month on activity in VK4, firstly from Noel Lynch VK4ZNI who is Secretary of the Brisbane VHF Group, who sent notes prepared by their President, Dave Laurie VK4DT, which are as follows.

General: The Brisbane VHF Group has about 50 active members and holds general meetings on the fourth Thursday of each month. All visitors welcome to the Club Rooms in the Oakleigh Scout Grounds off High Street. Dorrington. The Club has active 70 cm and Repeater Committees and runs a very successful fund raising venture.

52 MHz Band: There are about 25 stations active mostly using low to medium power SSB. Activity is mostly limited to Sunday mornings when many stations are on 52.050 and 52.100 MHz. Many stations will be active again in a Christmas, particularly when you can hear their "beacon" TV station TVQ0. Many stations also monitor 52.525 MHz FM as a guide to band conditions.

144 MHz Band: About 40 stations are active on the lower end of this band using a mixture of SSB and AM. (VK5 stations might note this amount of activity and take heed . . 5LP). The main calling frequency is 144.100 MHz and a call there during the evening will result in a QSO. Several stations are capable of working through Oscar 6, several more building equipment.

On the "push-button" frequencies, Channel 40 and 50 are the most popular with activity by about 100 stations spread evenly between them. Two repeaters (Ch. 1 Mt. Tamborine and Ch. 3 Ipswich) are currently in operation, and two others (Ch. 2 Toowoomba and Ch. 4 Mt. Glorious) have licence applications pending.

432 MHz Band: About 12 stations operate using SSB, FM and AM. The Brisbane VHF Group is holding a series of lectures aimed at increasing interest and activity on this band. Another 20 members are commencing construction of a 70 cm converter as a Group project.

The Group's 70 cm Committee is also engaged in the construction of an unattended 70 cm beacon transmitter The project is about 60% complete, and a licence is soon to be applied for, and the aim of the beacon is principally to aid members to tune up their converters. A lot of interest is being expressed in 70 cm repeaters in S.E. Queensland, and the Group will be active in the bandplanning [illegible]

Conclusion: The Group is encouraging increased activity on these three bands and in the future will be setting its sights on higher bands.

Thanks chaps for your notes of interest. Will be pleased to hear from you again.

Whilst still in Queensland, John VK4UI sends news of some of the work of the Gold Coast Radio Club at Southport. He reports the new mast for the repeater on Mt. Tamborine has been erected, but not yet completed. The new high gain aerial systems have still to be attached, and secured against storm damage. When the VHF repeater is completed, work will commence on a U.H.F. Repeater Project for 432 MHz using the same site and mast. They have been fortunate through the good services of John Willis VK4WN of Willis Communications, Brisbane, in securing a complete transmitter/receiver for the U.H.F. Repeater. Good luck fellas.

REPEATER USER GROUP

While we still seem to be on repeaters, I note with interest the setting up of such a group in VK6 (from the VK6 VHF Group Newsletter) for the maintenance, and financial operation of the repeaters, so anyone who uses repeaters under the control of the Group are considered members, for which a fee of $4.00 p.a. is expected. This seems fair enough, and I note a similar line of thinking is being undertaken in VK5 from notes in the VK5 Journal.

In VK5 there has already been some help with finance from members, plus some who are not members of W.I.A. — for best reasons known only to them — so it only seems logical where considerable running costs are involved that these costs should be shared by all users, not those who contribute as W.I.A. members. Unfortunately this comment won't be read by those mostly to whom it is directed, the non-members, so members should take up the issue with those who subscribe nothing.

Talking of running costs, I see an interesting comment in a letter published in "QRM" from Northern Tasmania, that over in Botswana in Africa where Chris VK7UX happens to be, the power charge is 15c per Kw, with the exchange rate being the same as the $A. It may pay you to take your own alternator if going there.

E.M.E. REPORT

Still no one writes except the Dapto N.S.W. Group, so I can only presume all others scheduling EME are satisfied to the limit or don't have the time to write, which is a pity. However, Dapto reports:

"EME tests scheduled for 9/8/75 with K2UYH, W1SL and VE7BBG, but they could not get on. However, W3CCX called us and was worked for our first contact with them. The second test period for 9/8 was a European CQ period. Called by F9FT and had our first contact with him. PA0SSB also called us but we missed out on a contact due to the moon getting too low. He had a good signal. We were also heard by G3LTF.

"F5SE (2nd op. of F9FT) has since advised the point to point distance between us is 16821 Km which is just 100 Km short of our record with G3LTF. He also provided details of several interesting extra galactic radio sources, some of which are in our window As they emit a constant signal they can be a useful reference for calibration purposes. F5SE has derived a formula for their use and has asked us to check it on certain sources accessible only in the southern hemisphere. F9FT has a big signal which peaked to 10dB over noise for a short period.

"We have now had 432 MHz contacts with six different stations in four countries (but no VK contacts yet!!). With our higher power output we hope for several more contacts over the next few months as 6 contacts in 5 years effort probably does not seem a lot!

VK5 ACTIVITY

As you guessed, there is not a lot to report, but it is noted that Keith VK5SV has been hearing the Mt. William repeater on Ch. 1 occasionally, not strong on 10/9 0230Z Tues. 23/9 Keith worked VK5ZWP at Cleve on the West Coast via the Ch. 1 repeater Also heard VK3VL and VK2YAH who was at Swan Hill . . . Meteor scatter contacts are being made again. Old Wally VK2ZNW (ex-5ZWW) made it to Peter VK5ZPW with good signals on 23/9. Peter is now using a pair of 6146B's and has a potent signal. Good work chaps. A few changes are likely to be made at this QTH (5LP) which than might allow me to send a M/s signal over to Wally, even the Baron of Oyster Bay, Rod VK2BQJ might show interest also!

VK5 CONTEST

A reminder of the VK5 VHF Group Contest over the weekend of 6th and 7th December The 6 metre band will be open to the Eastern States during that period so some good contacts should ensue. Appears a number of stations and groups are likely to be going out on to their favourite mounta ns, and it will be as well to remember the ZL's are also going out onto their favourite mountains the same weekend.

Two metres will be available again this year in December so get the gear ready, contacts are being sought in Brisbane and Sydney from VK5. And there does not seem to be any reason why good conditions should not prevail to VK6 on 2 metres in the New Year period. You see!

S.M.I.R.K.

In the June 1975 issue of these notes, I outlined what SMIRK was (Six Metre International Radio Klub) with No. 1 SMIRK being Ray Clark, of San Antonio, Texas, U.S.A. Through the medium of Peter, VK6ZDY, comes some further information from Ray, and the following has been selected as likely to interest those who read these columns. The information has been edited where necessary to make concise reading.

The main information comes as of 29/8/75 which would be towards the end of the Northern Hemisphere Es season, and some very good contacts had been made considering we are down at the bottom of the 11 year cycle. K7TUO and K7GWE worked KH6EQI in Hawaii, and Ray remarks that is the first honest-to-goodness contact to KH6 he knows of in the past few years. The rest have been third and fourth hand reports. VE1, VE2 and VE3 in Canada were worked, also C6A, TG9KJ, KP4, XE1, XE2, T12NA and YV5RA have been heard or worked.

VE1ATN on 50.056 is a beacon station, while FO8DR is still active on 6 metres in Tahiti. KZ5WA should be on 50.110, also HP1XCC. On Swan Island HR6SWA should be using SSB on 50.110, and HC8GL also on. Guam has more than one beacon, listen for KG6JDX on 50.105 and KG6APP on 50.150. K2IRT/KG6 runs a beacon on 50.098 and listens on 52.150 or 52.060. (That last bit is interesting to us . . . 5LP).

Across the Pacific in Japan, Ray advises quite a lot of 6 metre activity, though six metre stations have had their power cut back from 50 to 20 watts since June due to the QRM caused by the mass of JA stations in operation. Stations to listen for are, JO1YAA beacon on 50.110 K2IRT/KG6, KG6APP, KG6JDX, HL9WI, HM1GO, HM1FM (on FM), JA0OKM/JD1, HM1EJ, KG6JCM, VS6AI, VS6BE, JE3DGJ/JD1, KG6JFT, KG6JFR and VK4IK/KG6. Bill KX6HK is now in U.S.A. on 6 metres in New England, having left the Marshall Islands. A new station on is HL9VP.

That about covers the best of the information, but it is very interesting. Those of you sufficiently interested will be able to get out your prefix lists and maps and pin-point where some of these stations are located. With so many people now owning FT620's with their capability of tuning effectively down to 50 MHz, it would be a good idea for the keen DX-er to purchase the extra crystals to give the full coverage from 50 to 54 MHz. I have the full range in my FT620 and with the facility of being able to quickly peak the front end of the receiving section, adequate sensitivity is available over the full range. Bear in mind also our antennas will still have some useable gain down to 50 MHz despite being cut for 52 MHz due to the slower taper off in performance of a yagi as the frequency is lowered away from the resonant point. The

reverse is true for the W stations whose antennas will lose efficiency faster on coming up to 52 MHz, but then they run more power as a rule.

With the slow rise out of the low part of the cycle from now onwards, and with so much better equipment now in use, every possibility exists for trans-Pacific contacts to take place before too long. And we must remember the Americans are now more interested in working us, and are aware of our 2 MHz difference in frequency, which did not seem to be the case in general during the last sun-spot peak. Also do not overlook the fact that if you have a full call, then be set up to use CW on 52 MHz when that elusive or exclusive DX comes through; get set up now.

Peter VK6ZDY adds a little information himself. He mentions the Perth beacons at Bickley have their antennas mounted at the 130 foot level on the Channel 7 TV mast, the 6 metre beacon running with 23 watts out and the 2 metre 10 watts out.

Peter advises no TEP heard or worked from Perth for 1975 so far, so conditions are really at a low ebb. He will be set up before Christmas for high power 2 metre operation, so maybe the Perth barrier can be broken this year, and take the prizes away from the Albany area.

My thanks go to George VK3HV for the receipt of a very well set out Repeater Directory covering all States 146 and 435 MHz. Information will be drawn from this as required.

Can get up on my large soap box again with a plea to users of the FM section of the 2 metre band to help us to retain the lower section of 2 metres by becoming operational there as well. I have no objections whatever to FM and/or repeater operation by anyone, but I am afraid for the safety of 144 MHz, especially here in VK5 where the operation is almost nil, but hundreds of stations operate on 3 or 4 FM channels. Or don't you care?

Closing with the thought for the month: "Let us not look back in anger, nor forward in fear, but around in awareness"

The Voice in the Hills. ■

LARA

LADIES AMATEUR RADIO ASSOCIATION NEWS

LARA has been growing steadily over the last few weeks. As well as this, LARA has started to develop various projects which members have suggested. Some of these are for the benefit of amateur radio in general and not just the YLs. Other projects are designed to help YLs just starting off in amateur radio since it is difficult to start from scratch, as many of us are doing.

Events such as YL/OM foxhunts are designed to be family events with everyone participating (as well as being good fun!) The spectacle of YLs standing around bored or staying at home on field days, might just disappear if these events can continue.

Weekly skeds on 80m are now uniting YLs all over Australia with occasional visitors also appearing on the nets. We all know how lonely it can feel to be a YL in what is somewhat overwhelmingly, an OM field. Our first skeds were quite funny with a few 'rookie' operators being 'mike shy' but getting together with other YLs for a chat is a very rewarding experience. We all have to start somewhere and the YL skeds are a friendly atmosphere for getting your feet wet. YLs who don't yet have licences also join in these skeds as guests on OM's calls (with supervision). This allows us some access to the bands and is a great incentive for getting one's own call. More YLs are being seen at WIA and club classes and we will have some brand new YL calls after the 'next exams'.

Possibly as YL amateurs become more numerous the PMG will desist from addressing their communications to 'Dear Sir'!

One LARA project which has been getting off the ground in VK3 is the crystal bank. This is a scheme whereby donated crystals are loaned to amateurs, over a certain period, for a small fee. This should cover running costs and will allow purchase of additional crystals when demand exceeds supply. Some crystals will be offered for sale or exchange from time to time to allow updating of the available range. We will be keeping as large a range of amateur band crystals as possible with any amateur eligible to borrow. When Novice calls are introduced we will be able to help these operators to get on the air with crystal controlled rigs. The establishment of crystal banks in other States would be a move to be considered by clubs and groups as this is a realisation of the amateur spirit of helping the beginner.

For the future, LARA is planning to start a YL award with conditions similar to those of other awards, the difference being that both licensed and unlicensed YLs will be able to enter. On an international level LARA has contacted the ZL YL organisation, WARO, and helpful suggestions from this established group were much appreciated in getting LARA on its feet. ZL operators have been heard on the VK nets and hopefully, some events and skeds will be organised between the two Associations.

LARA in VK3 is planning some local events such as foxhunts and YL events at club and Zone field days. The social side will be organised with meetings to bring the group together and other events in store.

LARA in VK3 can be contacted via the WIA Victorian Division or you can join in the weekly skeds held on Monday nights at 8.00 pm EAST on 3650 kHz (and on Tuesday nights a 2m FM sked for Melbourne YLs starting on Channel 1). ■

MAGAZINE INDEX

with Syd Clark, VK3ASC

BREAK-IN August 1975
A 6 Metre Transverter for the FT101; A Battery Saver for the Wellington Walkie; Making Printed Circuit Boards; Converting the Pye Commando to 80 & 40 Metre Operation; T.R.I.C.O.; Sock It to Me; A High Performance VHF Converter.

RADIO COMMUNICATION July
Bulletin Reflections, Switched Polarization Cubical Quad; A Simple pre-scaler for 145 MHz; Technical Topics deals New Graphic Symbols; Wavechange switching with Diodes; Variable Power Supply; More on Cathode Impedance & Class C; PAOKSB Phased Locked VFO; VFO Stabilized by PAL Delay Line; Single Sideband CW; Building Blocks for the Novice.

September
Subjective Selectivity and Stereocode; 2m SSB Transmitter using the FR400SDX VFO; GB310W a 10 GHz Beacon; TT; Home Office TVI Statistics; Class E High Efficiency Amplifiers; Delay Line Oscillators; The G3ULR PALO; Elastic Aerial Supports; Audible Output from Digital Instruments; Third Method SSB — A Warning; Long Delay Echoes Unheard; A Teleprinter Message Generator; Cumulative Index 1970-4.

MOBILE NEWS July
What shall we do with the Profit; Subscription Renewals; Maurice Margolis Award; TRIO TR2200 Transceiver Reviewed.

RADIO ZS June
Lightning Research; First Steps (30 years afterwards); Go and Take that Test.

READERS NOTE: Magazines indexed herein are Federal Office property and requests for copies of articles should be addressed to P.O. Box 150, Toorak, 3142, accompanied by a SASE and suitable donation to cover costs. ■

PROJECT AUSTRALIS

With DAVID HULL VK3ZDH

APOLOGY

Due to an unfortunate delivery problem the notes for October AR never made it. Our apologies to all those who rely on the orbit predictions.

FIRST BIRTHDAY

The 15th of October marked the third birthday for the first of the two present operational satellites, Oscar 6. The fact that the satellite was designed for a life of 12 months speaks well for the care devoted to its design and construction. Something should be said also for the persistence of the ground command stations since this satellite requires orbit by orbit attention.

PHASE III FREQUENCIES CHOSEN

Advice has been received from Dr. Karl Meinzer of AMSAT-DL regarding the final choice of the uplink — downlink bands for Oscar 8. It may be remembered that during the March satellite conference in Washington the author put forward the view that VK would prefer 2 metre uplink and 70 cm downlink as being the reverse of Oscar 7. This was very much a personal appreciation of what was suitable for VK, there being no time to refer this back to the WIA. Subsequent correspondence to me on this question backed my stand I am glad to say.

It has now been decided to fly a primary repeater using these frequencies (2 m up to 70 cm down) and if time permits a second repeater of reverse frequencies will also be flown, to be time shared as usage dictates. Australis' regards these decisions as being most suitable for the next satellite and is happy that the question has been resolved to the benefit of all concerned.

NOVEMBER PREDICTIONS

OSCAR 6 ("Oe" Days Only)				OSCAR 7				
	Orbit	Time	Long		Orbit		Time	Long
Date	No.	Z	°W	Date	No.	Mode	Z	°W
1	13917	01.29	73	1	4389	A	00.34	58
2	13927	00.28	58	2	4414	B	01.28	72
3	13942	01.23	72	3	4414	A	00.28	56
6	13979	00.18	55	4	4427	B	01.22	70
8	14004	00.13	54	5	4439	A	00.21	55
9	14017	01.06	68	6	4452	B	01.16	68
10	14029	00.08	53	7	4464	A	00.15	53
13	14067	00.58	56	8	4477	B	01.09	67
15	14092	00.53	54	9	4489	A	00.08	52
16	14105	01.47	78	10	4502	B	01.03	65
17	14117	00.47	62	11	4514	A	00.02	50
20	14155	01.37	75	12	4527	B	00.58	64
22	14180	01.32	74	13	4540	A	01.50	77
23	14192	00.32	59	14	4552	B	00.50	62
24	14205	01.27	73	15	4565	A	01.44	76
27	14242	00.22	56	16	4577	B	00.44	60
29	14267	00.17	55	17	4590	A	01.38	74
30	14280	01.11	69	18	4602	B	00.37	59
				19	4615	A	01.32	72
				20	4627	B	00.31	57
				21	4640	A	01.25	71
				22	4652	B	00.24	55
				23	4665	A	01.19	69
				24	4677	B	00.18	54
				25	4690	A	01.12	67
				26	4702	B	00.12	52
				27	4715	A	01.06	66
				28	4727	B	00.05	51
				29	4740	A	00.59	64
				30	4753	B	01.54	76

DECEMBER PREDICTIONS

1	14292	00.11	54	1	4765	A	00.53	63
4	14330	01.01	66	2	4778	B	01.46	76
6	14355	00.56	55	3	4790	A	00.47	61
7	14368	01.51	76	4	4803	B	01.41	76
8	14380	00.51	63	5	4815	A	00.41	60
11	14418	01.41	76	6	4828	B	01.35	73
13	14443	01.36	75	7	4840	A	00.34	58
14	14455	00.36	60	8	4853	B	01.29	72
15	14468	01.30	73	9	4865	A	00.28	56
18	14505	00.25	57	10	4878	B	01.22	70
20	14530	00.20	56	11	4890	A	00.22	55
21	14543	01.15	70	12	4903	B	01.16	66
22	14556	00.15	54	13	4915	A	00.15	53
25	14593	01.05	67	14	4928	B	01.09	67
27	14618	01.00	66	15	4940	A	00.09	51
28	14630	00.00	51	16	4953	B	01.03	65
29	14643	00.55	65	17	4965	A	00.02	50
				18	4978	B	00.57	64
				19	4991	A	01.51	77
				20	5003	B	00.50	62
				21	5016	A	01.45	76
				22	5028	B	00.44	60
				23	5041	A	01.38	74
				24	5053	B	00.38	59
				25	5066	A	01.32	72
				26	5078	B	00.31	57
				27	5091	A	01.25	71
				28	5103	B	00.25	56
				29	5116	A	01.19	69
				30	5128	B	00.18	54
				31	5141	A	01.13	68

Please Note Oscar 7 should stay on mode A through Jan. 1 in order to resume odd day mode A even day mode B during 1976. ■

LIONS INTERNATIONAL

VK4CW has sent a photocopy of a letter from Lions International advising he obtained first place internationally in the 1975 Hunting Lions in the Air Contest whilst VK5ZX secured 4th position. This contest he says is held annually over the 2nd weekend in January using the top 25 kHz of most bands.

YRCS

with Bob Guthberlet

31 Bandon Terrace, Marino, S.A., 5049.

The story is told of a preacher who was asked to conduct a service in a small church set amidst the scrub in the Adelaide hills. Arriving several minutes before the appointed hour he decided to make an inspection of the property. The outside appearance suggested a poverty stricken congregation, but inside the furnishings indicated that the people valued their place of worship. In the porch he noticed a small table covered with a green baize cloth and on it a small wooden box with the word "Donations" printed on the l.d. As a friendly gesture he opened the box and placed a two shilling piece therein. With the arrival of the congregation the service commenced and at the conclusion, an elderly steward approached the preacher, and after thanking him, requested that he accept a donation to help defray travelling expenses, pointing out that they kept a small box in the porch for such purpose. Somewhat non-plussed the visitor kept silent. In the porch the box was duly opened; "Sorry, Sir", said the steward. "there's only two shillings here, but it may help a little"

Arriving back home the preacher told his family of the incident and how he received the money he had put into the box, whereupon his young son said, "Dad, don't you think if you had put more in you would have got more out?"

Far be it for me to moralise on this story — I leave it to your imagination. but if your club, or as a State Supervisor your YRCS affairs are not ticking as they should, perhaps you should ask yourself the pertinent question "Don't you think if you had put more in . . . . etc. etc"

Received a letter from VK6 a few days ago informing me that Norm Hyde has resigned from the position of State Supervisor. Thanks, Norm, for your help to YRCS. Now for a few excerpts from that letter which does not auger well for the future of the Scheme in the West. Quote, "The Hamilton Hill S.H.S. Club had the Science Master changed so the ham in charge of YRC was denied access to the Club transceiver which is part of the Science room facilities". Unquote. Here's the next one "Another S.H.S. Club has a FT101B but it is not allowed to put up any aerial. It has to be put up by the Public Works Department who are not interested". Unquote. The final quote: "Each High School is under the jurisdiction of its Head Master and each one has different ideas" Unquote.

One can only hope that those responsible for this Gilbertian situation know what they are doing to youth. On many previous occasions I have appealed to State WIA Divisions to get right behind YRCS but with limited response. Why is it that State WIA Council's will not foster the very means whereby they could increase local membership. May I suggest to all State WIA Presidents that they include, at least once a quarter the following question on their agenda "What more can we do to promote the cause of YRCS in this State?"

And, I would like a few angry replies from those who are really interested in the welfare of young persons. Maybe, too many amateurs are filling the ether with nonsensical jabble as they twiddle the knobs on the little black boxes, and showing little or no concern for the generation which hasn't any encouragement to follow them, but probably will, despite the lack of support. ■

Awards Column

with BRIAN AUSTIN VK5CA

P.O. Box 7A, Crafers, SA 5152

WORKED ALL SM 2 (WASM 2) AWARD

The award is available to licensed amateurs. Contacts after 1-7-1953 are valid. QSL cards must be submitted with the application along with a check list showing full details of the contacts. The award is available for all CW, all phone and mixed modes. The fee for the award is 7 IRCs. The address for applications is

K. O. Friden,
P1, 325 Ollovstrand,
260 90 Bastad,
Sweden.

Stations require confirmed contacts with each of the 25 laens (countries):

A	Stockholm-Stad	SM0
B	Stockholm lan	SM0
C	Uppsala	SM5
D	Sodermanland	SM5
E	Ostergottland	SM5
F	Jonkoping	SM7
G	Kronberg	SM7
H	Kalmar	SM5, SM7
I	Gotland	SM1
K	Blekinge	SM7
L	Kristianstad	SM7
M	Malmohus	SM7
N	Halland	SM6
O	Goteborg och Bohus	SM6
P	Alvsborg	SM6
R	Skaraborg	SM6
S	Varmland	SM4
T	Orebro	SM4
U	Vastmanland	SM5
W	Kopparberg	SM4
X	Gavleborg	SM3
Y	Vasternorrland	SM3
Z	Jamtland	SM2
AC	Vasterbotten	SM2
BD	Norrbotten	SM2

1976 SUMMER OLYMPICS AWARD

A certificate to honor the 1976 Summer Olympics will be awarded to licensed amateurs who comply with the following requirements.

Amateurs must work 5 Montreal (island station). Contacts must be made between 1-8-1976 and 31-7-1976, any mode.

Send $1 or 5 IRCs and a copy of your log containing date, time, station worked and operator, mode, frequency, received signal report, sent signal report. No QSLs required.

Send applications to:

Secretary, Westminster Amateur Radio School,
Box 323,
Montreal Int'l Airport, A.M.F
P.Q. Canada.

WORKED ALL [illegible]

The award is available to licensed amateurs.

Contacts on and after 1-1-1955 are valid. Claims which must be sent by registered post, must be accompanied by proof in the form of QSL cards or letters and sent to the sponsor.

Endorsements are given for all CW or all phone of the QSL cards etc. clearly indicate the mode used. The fee for the award is 50 cents (South African currency). The award is, however, issued free to members of SARL. The address for applications is

Awards Manager,
South African Radio League,
Postbox 3911,
Cape Town,
Rep. of South Africa.

Requirements: 100 QSL cards or other proof are required as follows:

ZS1	16
ZS2	10
ZS3	3
ZS4	10
ZS5	16
ZS6	45

■

IONOSPHERIC PREDICTIONS

WITH LEN POYNTER VK3ZGP

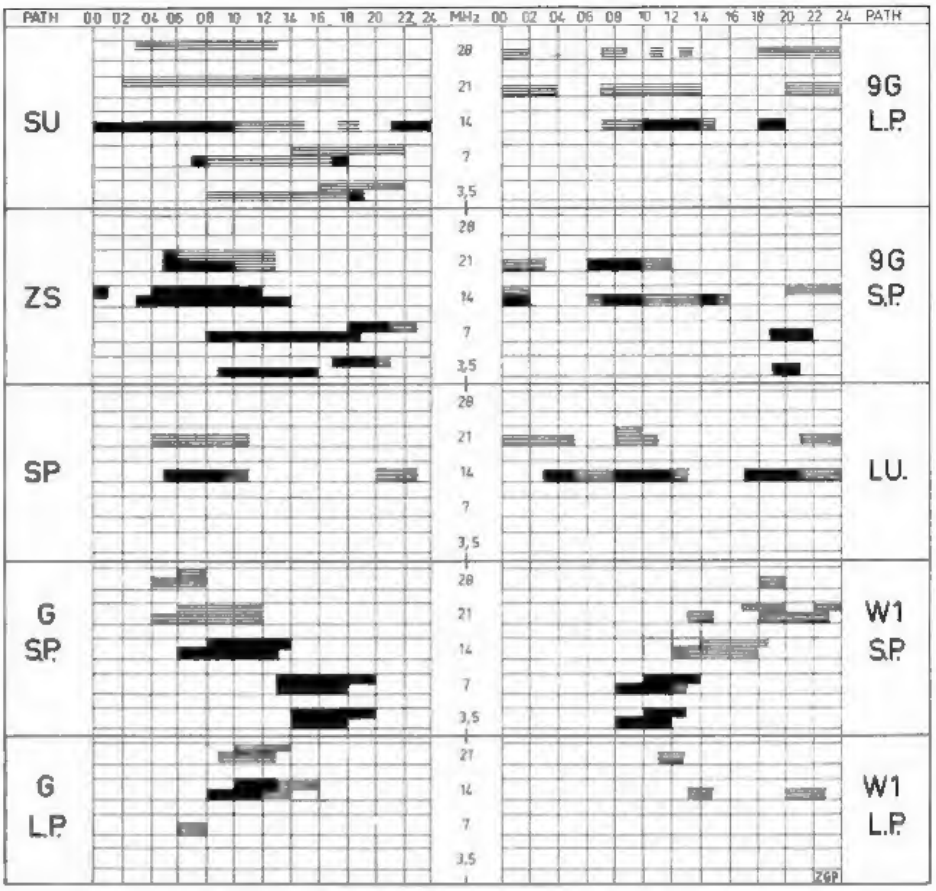
All times are UTC. Predictions courtesy of Ionospheric Prediction Service, Sydney. Sunspot information: Dr. Waldmeier, Swiss Federal Observatory, Zurich. Geomagnetic Planetary Indices: Institut fur Geophysik, Gottingen, Germany. K Indices Local: Toolangi Geomagnetic Observatory, Melbourne.

I trust that last month's effort will not have been in vain; somehow I was out in proportion and caused much confusion. This month I have tried a form of bar chart. Each block indicates paths eastwards and westwards. The top portion is based on Perth, the lower portion based on Canberra.

To read: The black portions are based on predictions for time of year, etc., when the path would normaly be open. The striped portions indicate openings that could occur with abnormally good conditions.

In retrospect, July, August, September has shown a slight upward trend in sunspot activity with a distinct peak during the first week in August, and is now settling down again to normal in the latter part of September. Solar activity in the terms of Solar Flux has lifted since the April, May, June low. Geomagnetic disturbances have noticeably less activity, averaging two per month but only of moderate activity and lasting three or four days.

If you are following WWV K index at +14 mins, it has been noted that a period of good conditions exists just prior to a rise in the K index. So the qualification 'tending to rise' will indicate a period of unsettled conditions to follow. During August and September some good openings occurred on 1.8 and 3.5 MHz, 7 MHz has improved, whilst 14 MHz has produced some fine openings across all paths within the predicted times. 21 MHz has shown some promise, but not quite across to Africa yet. 28 MHz has been very patchy with just a few



North-South openings of short duration observed.

Smoothed Sunspot Number (R6) for February 75 was 22.2. The August mean was relatively high at 39.3 (July 28.3, June 11.4). The predictions for smoothed numbers to February 76 have risen slightly, no doubt as a result of the July, August highs. They now run (July 75) Sept 15, Oct 13, Nov 12, Dec 10, Jan 9, Feb 8.

Looking back to Frank Hines VK2QL summaries of monthly means sometime back, a low of 3.4 in April 54 and 9.7 in Oct 64, then looking at June 75 at 11.4, we could almost be bold enough to say we are at the bottom six months. March/April 76 still looks a reasonable target for the crystal-ball gazers. Here's hoping.

Hope you are still trying correlation of the Indices. Should anyone require copies of July, August Indices, or any month onwards, a SASE with a 9 x 4 envelope will provide you with a copy. QTH is okay in any call book since 61. ■

Afterthoughts

ADDITIONS TO RULES FOR VK5 FIELD DAY

Additional rule No. 1:
Contacts via Oscar Satellite may contact each station every pass.

Additional rule No. 2:
Cross bands points multiply by points of highest band used.

Additional rule No. 3:
Mark logs stations either multi-operator or single operation for purpose of scoring.

Hamads

- **Eight lines free to all WIA members. $5 per 3 cm for non-members.**
- **Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.**
- **Commercial advertising is excluded.**
- **Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.**
- **QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.**
- **The current WIA Callbook is the 1975 edition.**

FOR SALE

Mobile HF Ant. Mounting Base, CW heavy duty spring and integral 50 ohm ½" coax (approx. 10 ft.). New — still in carton (Belling Lee). $20 or offer. Phone Ron VK3CN (056) 55 1929. 26 Radovick St., Korumburra, 3950.

Collins 75S1 Receiver, fitted with Waters rejection tuning, mint condition, $350. VK4VK 5 Tosti St., Sorrento, 4217. Ph. (075) 38 4164.

Drake Complete Station, R4B Rx, T4XB Tx, MS4 speaker, all as new, $695. VK3OM, QTHR. Ph. (03) 560 9215.

Frontier 1200QT Transceiver, $150. SR550 Star Rx (amateur bands only), $95. VHF Pye Overland (not converted), $20. VK2ALK. Ph. (02) 528 7967.

6M-SSB-Heath SB110A SSB/CW transceiver with HP23 AC PSU and port. beam, 180W PEP Tx — 0.1 uV Rx sens., $330, Heath HP 13A 12V DC/DC PSU, $35. 2M Poly-Comm 144-146 AM/CW tuneable transceiver with inbuilt Rx VFO and Tx VFO or ext. xtal, squelch, noise blanker, AC/DC PSU inbuilt. Copies FM FB excellent for mobile or base, $135. All units in mint cond. with manuals and cables. VK3BGW, L. Kubis, QTHR. Ph. (03) 232 6528 A.H. or (03) 699 2011 bus.

Pye Base Station PTCA703, 3/20 final 53.032 MHz and PTCA116 Mk III mobile unit. Both in going condition. $34 ONO. VK3YFB, QTHR. Ph. (03) 758 1738.

Comm. Rx TCA R5223. 14 tubes, 29 bands, xtal locked dual conversion, hi stability, new, never in service. Sell BO or trade VHF gear. A. L. MacFarlane, Lardner Rd., Warragul, 3820.

Carphone STC 131, solid state except 2 valves in Tx — 25W — fitted with chan. 1, 4, 40 & 50, $75. VK2AVQ, QTHR. Ph. (02) 88 2359.

1 kVA Powamac, 3 hp B & S, $160. VK3VK, QTHR. Ph. AH (054) 23 7213.

Swan 400, excellent condition, external power supply, spare set tubes, microphone, manual, $325 ONO. Noel Hill VK1NH, 50 Hicks St., Red Hill, Canberra. Ph. (062) 95 0992 pm only; (062) 41 1000 bus. hours.

Hallicrafters SR150 Transceiver, 80-10m, works well all bands, new PA tubes, complete with home brew PSU, $300 ONO. VK3ZU, QTHR. Ph. AH (03) 560 5136.

FTDX 400 SSB Transceiver, 80-10m, in excellent working condition and appearance. Complete with SP400 matching speaker unit, handbook and spare valves, $400. VK5GV, QTHR. Ph. (08) 252 5152.

Hallicrafters HT32A, xtal filter Tx, 80-10m, 100W PEP, SSB, CW, AM, very good condition, with manual, $165. **Hallicrafters SX101A** Rx, 80-10m, 30.5 MHz, converter channel, SSB, AM, CW, variable selectivity, very good condition, with manual, $200. Both units and "Slidup" auto trans., $360 ONO. VK3HZ, QTHR. Ph. (03) 56 5088.

Advance type D1D VHF sig. gen., 10-300 MHz fund sine, SQ, CW, calib., xtal, VM accurate calib. dial and atten. cables and term. Weight 38 lbs., mint cond., $260. VK2ZRD, QTHR, but post code 2082. Ph. (02) 458 1577.

Yaesu FT200 and FP200 PSU. Offers wanted for these and sundry components. All must be sold on behalf of the estate of the late R. N. Buzacott VK3AUB. VK3VF, QTHR. Ph. (03) 723 3554.

12V to 240V 50 Hz .5A Converter, 125 VA regulated and protected. Fully solid state DC Electronics Model 100. Can be slaved to other units, $60. VK5TT 3 Ilford Street, Vale Park. Ph. (08) 262 5313, ext. 2387, bus. hours.

Fibreglass Guy Line, 5000 lbs tensile, 60 cents per metre, also 7/16 galv. strand, two tons. VK4WR, 6 Olive Court, Nambour, 4560.

FT501, just 8 weeks old, complete with matching power supply, digital readout, etc. Immac. cond., must sell, $500 ONO. M. Hardy, VK2AAM, Newcastle, Ph. 20321 bus. hours.

40 ft Oregon Mast, 4 x 4 at base, tapers towards top. Any offers, VK2DT, 2 Patya Close, Epping, 2121. Ph. (02) 868 1131 — delivery can be arranged.

Collins R391/URR Receiver, .5-32 MHz in 32 bands. See AR articles, $400. **Hewlett Packard 524B** freq. meter, 0-100 MHz, 8 digit readout, $120, good cond. with manuals. J. G. Maciver, VK4JE, QTHR. Ph. (072) 80 4020.

Communication Rx type R5223, covers 1.5 MHz to 30.5 MHz in 29 switched bands. BFO noise limiter, inbuilt PSU for 230/110 or 24V DC, inbuilt speaker, with all leads, headphones and complete service manual, tested overall on all ranges 2 uV for 10 dB S/N. Unit is similar to the 51J series of receivers, $200. C. Cook VK3ZBD/T. Ph. (03) 89 2117 (AH).

TCA1675 Hi-Band TXCR, unconverted, $25 ONO. **Power Transformer,** 500V CT to 3000V CT at 100-500 mA, cheap. Large numbers Rx and Tx tubes, cheap. Parts and CROs for SSTV, all types of meters. W. H. Ross VK3UT, QTHR. (055) 69 5220.

Barlow-Wadley XCR30, Rx 500 kHz - 30 MHz, $200. **Yaesu Musen FV101,** VFO, $90. **Swan 140 Transceiver,** converted to 80-40-20 TOPAZ 12V supply, HB AC supply, half whips, etc., $200. VK3PZ, QTHR. Ph. (03) 288 1047.

Collins 30L-1 Linear Amplifier, in immaculate condition, with manual, $400. Ian McCosker VK4PF, P.O. Box 274, Surfers Paradise, Qld. 4217. Ph. (075) 38 5487.

SELL Handbook for CE type SC6B single channel VHF R/T equipment, $10.00 plus postage. **WANTED** Handbook of service instructions for sweep generator AN/TRM3 and manual for Micovac VTVM type CT54. VK4ZTJ. Ph. (072) 88 6343.

SR550 Hamband Rx, $70.00. R. Devies, Box 909, Orange, 2800. Ph. (063) 6082 bus. hours. or (063) 6072 AH.

Multi-7 two metre transceiver, complete in original carton, fitted with Repeater channels 1, 2, 3 & 4, Contra Repeater channels 1, 2, 3 & 4, plus simplex channels 37, 40, 43, 50 and 51. Exchange for FT75 outfit. Cash adjustment. VK4UX, QTHR.

Heathkit Oscilloscope Model O-12-U, response to 6 MHz. New BWD CR tube and Mu-Metal shield fitted, good order, price $90 ONO. Heath-Kit Electronic Switch to suit above, response to 100 kHz, good order, price $30 ONO. Ric Hill VK3RC, QTHR. Mia Mia Road, Broadford. Ph. Broadford 359 (STD 057842211 to exchange).

Silent Keys

It is with deep regret that we record the passing of—

R. N. BUZACOTT VK3AUB

New UR67 Coax Cable, 50 yard roll, $25, plus freight. Max VK4DA, QTHR. Ph. (074) 63 3524.

QSTs, professionally bound, light blue with gold lettering in sets of six, Jan-June 1968 to Jan-June 1975, i.e. 15 in all. Roth Jones, 1 Albert Rd., Melbourne, 3004.

WANTED

May 75 issue of RSGB Radio Communication. My copy lost in mail. Write Ron VK3CN, 26 Radovick St., Korumburra, 3950.

FTV-650 or similar 6 metre transverter. VK4VK, 5 Tosti St., Sorrento, 4217. Ph. (075) 38 4164.

Antique Amateur Radio Gear, pre-1935, prefer in restorable condition, your price paid. VK3OM, QTHR. Ph. (03) 560 9215.

Control Unit for Low-Band AWA MR10A. VK3ZTA, QTHR. Ph. (03) 560 1157 AH.

Xtals for Novice to Be, 10500 KC, 17500 KC, 245 KC. Also 80m fundamentals, 3.525 to 3.575 MHz. Wes L60236, 118 Huntriss Rd., Doubleview, 6018. Ph. (092) 46 3008.

Roller inductor (approx 28 uH), suitable ARRL Transmatch. Also require transmitting type variable capacitors (a) two gang, 200 pF per section; (b) single gang 350 pF, willing pay any reasonable prices. VK3LJ, QTHR.

Help — poor student trying to get on 160m. Needs QB3/300 or QY3/125. Sam VK2BVS, VK2BGV, QTHR. Ph.. (02) 407 1066.

Mast, tilt-over and/or crank-up. Also rotator and **20 metre beam** or tri-bander. Mal Sinclair VK2BMS, QTHR. Ph. (02) 407 0261 bus. hours or (02) 95 2382 AH.

20, 40 and 80 metre coils for AR7 Communications Receiver, push-in type coils, approx. 11 inches long, 2 inches wide. Write to P.O. Box 86, Umina Beach N.S.W.

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RTTY 7B Vol 1 — concerns Creed 7 and 8 teleprinters **$1.50**

RTTY 7B Vol. 2 — concerns Creed 7 and 47 teleprinters **$2.10**

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NOVEMBER, 1975
VOL. 43, No. 11

VHF Mobile/Base Station FT-221 2 Meter Transceiver

FT-221 inc. mic., AC & DC power, cable and Acc plugs

$588

— from Yaesu Musen Co. of Japan

SOLID STATE ULTIMATE 2 METRE TRANSCEIVER WITH VERSATILE SSB/FM/CW/AM OPERATION

Here is a compact, versatile transceiver designed for the active 2 metre enthusiast. The FT-221 features all mode operation — SSB/FM/CW/AM — with repeater offset capability. Advanced phase lock loop circuitry offers unsurpassed stability and clean spurious free signals. Modular, computer type construction offers reliability and ease of service. Pre-set pass band tuning provides the optimum selectivity and performance needed on today's active 2 metre band. Join the fun on FM, DX, or OSCAR, with the FT-221 transceiver. Another winner from the world's leader in amateur communications equipment.

FEATURES

- ★ Complete 144-148 MHz coverage in 6 band segments
- ★ Dual rate, concentric VFO dial drive with better than 1 kHz readout
- ★ Built-in AC & DC power supplies
- ★ SSB/CW/FM/AM operation
- ★ Selectable ±600 kHz repeater offset
- ★ Built-in VOX and break-in CW
- ★ External tone input connector
- ★ Built-in 100 kHz calibrator.
- ★ Built-in effective noise blanker
- ★ Three way metering: S meter, power output, and FM discriminator
- ★ 11 crystal channels per band segment = Total 66 channel
- ★ SSB output 12 watts PEP
  FM/CW output 14 watts
  AM output 2.5 watts
- ★ Built-in speaker

TECHNICAL DATA

GENERAL

Frequency Range: 144.00 to 148.00 MHz in eight 500 kHz segments.
Mode: SSB (selectable USB or LSB), AM, FM or CW.
Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 20 Hz with 10% line voltage variation.
Calibration Accuracy: 1 kHz maximum after 100 kHz calibration.
Backlash: Not more than 50 Hz.
Antenna Impedance: 50 ohm unbalanced nominal.
Power Requirement: 100/110/117/200/220/234V AC, 50/60 Hz, 100 VA maximum or 13.5V DC, 3A transmit maximum (11.5-16.5V DC).
Size: 200(W) x 125(H) x 295(D) mm.
Weight: 8.5 kg (Shipping weight: 13 kg).

RECEIVER

Sensitivity: 0.5 uV for 10 dB Noise plus Signal to Noise Ratio on SSB/CW. 1.0 uV for 10 dB Noise plus Signal to Noise Ratio with 400 Hz 30% modulation on AM. 0.75 uV for 20 dB quieting on FM.
Selectivity: 2.4 kHz nominal bandwidth at 6 dB down, 4.1 kHz at 60 dB down on SSB/CW/AM. ±6 kHz nominal bandwidth at 6 dB down, ± 12 kHz at 60 dB down on FM.
Harmonic & Spurious Response: Image Ratio better than 60 dB.
Audio Output: 2 Watts to internal or external speaker at 4 ohm impedance.
Squelch Threshold: Less than 0.3 uV.
I.F. Frequencies: SSB/AM/CW 10.7 MHz, FM 10.7 MHz and 455 kHz.

TRANSMITTER

Spurious Radiation: —60 dB.
Frequency Response: Balanced SSB 300 to 2700 Hz :±3 dB. Low power AM better than 80%. Variable reactance FM ±7.5 kHz maximum.
Carrier Suppression: —50 dB.
Sideband Suppression: —50 dB.

90 DAY WARRANTY

All prices include S.T. Freight & ins. extra. Prices and specifications subject to change. Spare parts availability. Full service facilities with after-sales service only from the authorised **YAESU AUSTRALIAN AGENT:—**